

ภาคผนวก จ

---

เอกสารสอบเทียบเครื่องมือที่ใช้ในการตรวจวิเคราะห์

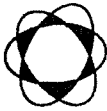
ตารางการสอบเทียบเครื่องมือที่ใช้ในการตรวจวัดและวิเคราะห์



Thai Environmental Technic Limited  
บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด

Item	Description	Parameter	List of Equipment	Equipment No.	Calibration	Next Calibration
1.	Ambient Air	ORIFICE  TSP	ORIFICE TRANSFER STANDARD/Tisch	S/N 0068	17/08/2023	August 2024
			High Volume Air Sampler/TET	S/N TSP-11	02/07/2024	July 2025
			High Volume Air Sampler/TET	S/N TSP-39	01/07/2024	July 2025
		ORIFICE  PM-10	Electronic Balance/METTLER TOLEDO	S/N 1116392227	10/04/2024	April 2025
			ORIFICE TRANSFER STANDARD/Tisch	S/N 0068	17/08/2023	August 2024
			High Volume Air Sampler/TET	S/N PM10-12	02/07/2024	July 2025
		PM-2.5	High Volume Air Sampler/TET	S/N PM10-17	03/07/2024	July 2025
			Electronic Balance/METTLER TOLEDO	S/N 1116392227	10/04/2024	April 2025
			Certificate of Calibration/MesaLabs	S/N 172508	29/09/2023	September 2024
		NO <sub>2</sub>	PM 2.5/PQ200	S/N 72477	03/05/2024	May 2025
			PM 2.5/PQ200	S/N 72614	02/05/2024	May 2025
			Electronic Balance/METTLER TOLEDO	S/N 1116392227	10/04/2024	April 2025
		SO <sub>2</sub>	CERTIFICATE OF ACCURACY : Linde	S/N A00917SK	05/07/2023	July 2026
			NO <sub>x</sub> Analyzer/Teledyne 200E	S/N 1173	08/10/2024	April 2025
			NO <sub>x</sub> Analyzer/Teledyne T200	S/N 5158	07/10/2024	April 2025
			CERTIFICATE OF ACCURACY : Linde	S/N D636157	18/09/2023	September 2027
			SO <sub>x</sub> Analyzer/Teledyne 100E	S/N 064	02/10/2024	April 2025
			SO <sub>x</sub> Analyzer/Teledyne 100E	S/N 110	04/10/2024	April 2025





Thai Environmental Technic Limited  
บริษัท เทคนิสิ่งแวดล้อมไทย จำกัด

ตารางการสอบเทียบเครื่องมือที่ใช้ในการตรวจวัดและวิเคราะห์

Item	Description	Parameter	List of Equipment	Equipment No.	Calibration	Next Calibration
2.	Wastewater	pH	pH Meter/Horiba F-71G	S/N V3B1F8H3	31/10/2024	October 2025
		Colour	SPECTROPHOTOMETER/Blue Star A	S/N 1606UV1507	09/04/2024	April 2025
		TSS	Electronic Balance/METTTLER TOLEDO	S/N 1116392227	10/04/2024	April 2025
		TDS	Electronic Balance/METTTLER TOLEDO	S/N 1116392227	10/04/2024	April 2025
		DO	DO Meter/HORIBA	S/N D75J0012	09/02/2024	February 2025
		BOD	BOD Incubator/Model i250	S/N 0408-0115-0008	09/04/2024	April 2025
		Oil & Grease	Electronic Balance/METTTLER TOLEDO	S/N 1116392227	10/04/2024	April 2025
		Cyanide	Spectrophotometer/Blue Star A	S/N 1606UV1507	09/04/2024	April 2025
		Phenols	Spectrophotometer/Blue Star A	S/N 1606UV1507	09/04/2024	April 2025
		Compound				
		H <sub>2</sub> S	Spectrophotometer/Blue Star A	S/N 1606UV1507	09/04/2024	April 2025
		Cr <sup>+6</sup>	Spectrophotometer/Blue Star A	S/N 1606UV1507	09/04/2024	April 2025
		Hg	Atomic Absorption Spectrophotometer Model/PinAAcle 900Z	S/N PZBS23100902	27/12/2023	December 2024
		As, Se	Atomic Absorption Spectrophotometer Model/PinAAcle 900Z	S/N PZBS23100902	27/12/2023	December 2024
		Ba, Cd	ICP394/PerkinElmer/OPTIMA8000	S/N 078N1310024C	27/09/2024	March 2025
		Cu	ICP394/PerkinElmer/OPTIMA8000	S/N 078N1310024C	27/09/2024	March 2025
		Mn, Ni	ICP394/PerkinElmer/OPTIMA8000	S/N 078N1310024C	27/09/2024	March 2025
		Pb, Zn, Ag	ICP394/PerkinElmer/OPTIMA8000	S/N 078N1310024C	27/09/2024	March 2025





## CERTIFICATE OF CALIBRATION

Certificate No. : COF-008-66

Page 1 of 2 Pages

**MEASUREMENT ITEM** : Top Load Orifice  
**MANUFACTURER** : TISCH  
**MODEL/TYPE** : TE-5025A  
**SERIAL NUMBER** : 0068  
**ID NUMBER** : -  
**CONDITION AS-RECEIVED** : Used item  
**CUSTOMER** : Thai Environmental Technic Limited.  
1/6 Soi Ramkhamhaeng 145, Khwaeng/Khet Saphan Sung,  
Bangkok 10240

**RECEIVED DATE** : 08 Aug 2023  
**MEASUREMENT DATE** : 17 Aug 2023  
**ISSUE DATE** : 17 Aug 2023

### ENVIRONMENTAL CONDITIONS:

Ambient condition in the laboratory are as follow:

Temperature	: 23.0 ± 3.0	°C
Relative Humidity	: 55.0 ± 15.0	%RH
Atmospheric Pressure	: 1010 ± 10	hPa

### CALIBRATION CONDITION:

Preconditioning : 24 hours at ambient conditions.  
Measurement Condition : The average values during measurement are 23.8 °C and 54.3 %RH.

### Calibration procedure:

The Orifice gas flow device was calibrated against Standard Rotary Displacement Meter (Roots Meter) Model G65/IMC/W2-dp. The WI-CL-004 was used as a calibration guideline.

### Traceability.

This certificate provides a traceability of The measurement to recognized the national standards, and to realization of the international system of units (SI) through the VSL (National Metrology Institute of Netherlands) via Certificate number: G2211901

### Uncertainty of Measurement:

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

**NOTED:** The certificate is valid only to the item calibrated on date and place of calibration.

### TABULATION OF RESULTS:

The table on next page give the measured values.

Calibrated by:

- ☒ Mr. Sorawit Thachalad  
☐ Miss Jittraporn Lertsomphol



Approved signatory: .....

Mr. Parinya Booncharoen  
Calibration Department Manager

**MEASUREMENT RESULTS:**

The Orifice gas flow device was calibrated by direct comparison method with the Standard Rotary Displacement Meter (Roots Meter). The Humid air was used as a medium in the system. The standard conditions are 25°C (298.15 K) and 760 mmHg for standard temperature and standard pressure respectively.

**Table 1:** The results of  $Q$  Standard calibration data

Plate	Flow rate $m^3/min$	Pressure [Pa] mmHg	Temperature [Ta] °C	Temperature [Tm] °C	$\Delta p_{meter}$ mmHg	$\Delta p_{Orifice}$ inH <sub>2</sub> O	$\gamma$	Standard Flow [ $Q_s$ ] $m^3/min$
1	0.700	754.191	23.89	23.40	50.276	1.674	1.291	0.651
2	1.005	754.148	23.80	23.70	54.969	3.395	1.839	0.929
3	1.118	754.084	23.88	23.81	37.664	4.407	2.095	1.058
4	1.175	754.076	23.87	23.79	27.625	5.018	2.236	1.127
5	1.420	754.047	23.89	23.81	27.348	7.362	2.708	1.363

Slope ( $m$ ): 1.99045  
 Intercept ( $b$ ): -0.00789  
 Correlation coefficient ( $r$ ): 0.99979  
 Uncertainty ( $k=2$ ): 0.015  $m^3/min$

**Table 2:** The results of  $Q$  actual calibration data

Plate	Flow rate $m^3/min$	Pressure [Pa] mmHg	Temperature [Ta] °C	Temperature [Tm] °C	$\Delta p_{meter}$ mmHg	$\Delta p_{Orifice}$ inH <sub>2</sub> O	$\gamma$	Standard Flow [ $Q_a$ ] $m^3/min$
1	0.700	754.191	23.89	23.40	50.276	1.674	0.812	0.654
2	1.005	754.148	23.80	23.70	54.969	3.395	1.156	0.932
3	1.118	754.084	23.88	23.81	37.664	4.407	1.318	1.062
4	1.175	754.076	23.87	23.79	27.625	5.018	1.406	1.132
5	1.420	754.047	23.89	23.81	27.348	7.362	1.703	1.368

Slope ( $m$ ): 1.24671  
 Intercept ( $b$ ): -0.00497  
 Correlation coefficient ( $r$ ): 0.99979  
 Uncertainty ( $k=2$ ): 0.015  $m^3/min$

\*\*\*End of Certificate of Calibration\*\*\*





Thai Environmental Technic Limited  
บริษัท เทคโนโลยีสิ่งแวดล้อมไทย จำกัด

## High Volume TSP&PM-10 Calibration Report

Location: Thai Environmental Technic

Site ID: Bangkok

Date: 2-Jul-24

ITEM: TSP

Serial No: (No. 11)

Calibrate By: Pipat

### Site Conditions

Barometric Pressure (mm Hg) : 760.00

Temperature (°C) : 25.0

Average Press. (mm Hg) : 754.5

Average Temp (°C) : 29.6

Corrected Pressure (mm Hg) : 760.0

Temperature (deg K) : 298.0

Corrected Average (mm Hg) : -

Average Temp: (Deg K) : -

### Calibration Orifice

Make: Tisch

Model: TE-5025A

Serial#: 0068

Qstd Slope : 1.99045

Qstd Intercept : -0.00789

Calibration Due Date : 16-Aug-24

### Calibration Information

Plate or Test #	ORIFICE (in H <sub>2</sub> O)	Qstd (m3/min)	Indicate (CFM)	IC (corrected)	Linear Regression Slope : 28.9413 Intercept : 6.5287 Corr. Coeff : 0.9862 # of Observations: 5
1	12.80	1.801	60.0	57.00	
2	9.60	1.561	54.0	52.00	
3	7.20	1.352	50.0	48.00	
4	5.00	1.127	40.0	40.00	
5	3.00	0.874	30.0	30.00	

### Calculations

$$Qstd = 1/m[\text{Sqrt}(H_2O(Pa/Pstd)(Tstd/Ta)) - b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

$$1/m(I)[\text{Sqrt}(298/Tav)(Pav/760)] - b$$

NOTE: Ensure calibration orifice has been certified within 12 months of use

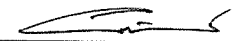
m = sampler slope

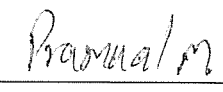
b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

Calibrate By : 

Approve By : 





Thai Environmental Technic Limited  
บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด

## High Volume TSP&PM-10 Calibration Report

Location: Thai Environmental Technic

Site ID: Bangkok

Date: 1-Jul-24

ITEM: TSP

Serial No: (No. 39)

Calibrate By: Pipat

### Site Conditions

Barometric Pressure (mm Hg) : 760.00

Temperature (°C) : 25.0

Average Press. (mm Hg) : 754.5

Average Temp (°C) : 30.5

Corrected Pressure (mm Hg) : 760.0

Temperature (deg K) : 298.0

Corrected Average (mm Hg) : -

Average Temp: (Deg K) : -

### Calibration Orifice

Make: Tisch

Model: TE-5025A

Serial#: 0068

Qstd Slope : 1.99045

Qstd Intercept : -0.00789

Calibration Due Date : 16-Aug-24

### Calibration Information

Plate or Test #	ORIFICE (in H <sub>2</sub> O)	Qstd (m3/min)	Indicate (CFM)	IC (corrected)	Linear Regression Slope : 29.1353 Intercept : 6.2563 Corr. Coeff : 0.9876 # of Observations: 5
1	12.60	1.787	60.0	57.00	
2	9.80	1.577	54.0	52.00	
3	7.20	1.352	50.0	48.00	
4	5.00	1.127	40.0	40.00	
5	3.00	0.874	30.0	30.00	

### Calculations

$$Qstd = 1/m[\text{Sqrt}(H_2O(Pa/Pstd)(Tstd/Ta)) - b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

$$1/m((I)[\text{Sqrt}(298/Tav)(Pav/760)] - b)$$

NOTE: Ensure calibration orifice has been certified within 12 months of use

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

Calibrate By : 

Approve By : 







Thai Environmental Technic Limited  
บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด

## High Volume TSP&PM-10 Calibration Report

Location: Thai Environmental Technic

Site ID: Bangkok

Date: 2-Jul-24

ITEM: PM10

Serial No: (No. 12 )

Calibrate By: Pipat

### Site Conditions

Barometric Pressure (mm Hg) : 760.00

Temperature (°C) : 25.0

Average Press. (mm Hg) : 754.4

Average Temp (°C) : 32.5

Corrected Pressure (mm Hg) : 760.0

Temperature (deg K) : 298.0

Corrected Average (mm Hg) : -

Average Temp: (Deg K) : -

### Calibration Orifice

Make: Tisch

Model: TE-5025A

Serial#: 0068

Qstd Slope : 1.99045

Qstd Intercept : -0.00789

Calibration Due Date : 16-Aug-24

### Calibration Information

Plate or Test #	ORIFICE (in H <sub>2</sub> O)	Qstd (m3/min)	Indicate (CFM)	IC (corrected)	Linear Regression Slope : 34.7808 Intercept : 0.7107 Corr. Coeff : 0.9926 # of Observations: 5
1	12.00	1.744	60.0	60.00	
2	9.20	1.528	54.0	54.00	
3	7.20	1.352	50.0	50.00	
4	5.00	1.127	40.0	40.00	
5	3.00	0.874	30.0	30.00	

### Calculations

$$Qstd = 1/m[\text{Sqrt}(H_2O(Pa/Pstd)(Tstd/Ta))]-b]$$

$$IC = l[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart response

l = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

$$1/m(l)[\text{Sqrt}(298/Tav)(Pav/760)]-b]$$

NOTE: Ensure calibration orifice has been certified within 12 months of use

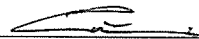
m = sampler slope

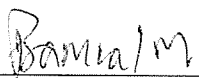
b = sampler intercept

l = chart response

Tav = daily average temperature

Pav = daily average pressure

Calibrate By : 

Approve By : 





Thai Environmental Technic Limited  
บริษัท เทคโนโลยีสิ่งแวดล้อมไทย จำกัด

## High Volume TSP&PM-10 Calibration Report

Location : Thai Environmental Technic

Site ID : Bangkok

Date : 3-Jul-24

ITEM : PM10

Serial No : (No. 17 )

Calibrate By : Pipat

### Site Conditions

Barometric Pressure (mm Hg) : 760.00

Temperature (°C) : 25.0

Average Press. (mm Hg) : 754.4

Average Temp (°C) : 30.4

Corrected Pressure (mm Hg) : 760.0

Temperature (deg K) : 298.0

Corrected Average (mm Hg) : -

Average Temp (Deg K) : -

### Calibration Orifice

Make : Tisch

Model : TE-5025A

Serial# : 0068

Qstd Slope : 1.99045

Qstd Intercept : -0.00789

Calibration Due Date : 16-Aug-24

### Calibration Information

Plate or Test #	ORIFICE (in H <sub>2</sub> O)	Qstd (m3/min)	Indicate (CFM)	IC (corrected)	Linear Regression Slope : 34.7808 Intercept : 0.7107 Corr. Coeff : 0.9926 # of Observations: 5
1	12.00	1.744	60.0	60.00	
2	9.20	1.528	54.0	54.00	
3	7.20	1.352	50.0	50.00	
4	5.00	1.127	40.0	40.00	
5	3.00	0.874	30.0	30.00	

### Calculations

$$Qstd = 1/m[\text{Sqrt}(H_2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

Tstd = 298 deg K

Pstd = 760 mm Hg

For subsequent calculation of sampler flow:

$$1/m((I[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

NOTE: Ensure calibration orifice has been certified within 12 months of use

m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure

Calibrate By : 

Approve By : 





Mesa Labs 12100 W. 6th Ave  
Lakewood, CO 80228  
NIST Traceable Calibration Facility

## CERTIFICATE OF CALIBRATION - NIST TRACEABILITY

Calibration Report #: 172508-29092023  
DeltaCal Serial Number: 172508  
Calibration Technician: Elsy Lasky  
Date: 29-Sep-2023  
Recommended Recal Date: 29-Sep-2024

### Critical Venturi Flow Meter

Max Uncertainty = 0.346%

TE20007	1.40 - 6.0 LPM	Calibration Due:	1-Aug-2024
TE20005	6 - 30.00 LPM	Calibration Due:	12-Aug-2024

Room Temperature:  $\pm 0.03^{\circ}\text{C}$  from  $-5^{\circ}\text{C}$  -  $70^{\circ}\text{C}$  Room Temperature:  $22.50^{\circ}\text{C}$

Brand: Eutechnics

TE Number: TE12242

Serial Number: A11441

Std Cal Date: 5-Oct-22

Std Cal Due Date: 5-Oct-23

Ambient Temperature (set):  $23.2^{\circ}\text{C}$

Aux (filter) Temperature (set):  $22.5^{\circ}\text{C}$

### Barometric and Absolute Pressure

Vaisala Model PTB330 (50-1100) Digital Accuracy: 0.03371%

TE Number: TE12311

Serial Number: H0850001

Std Cal Date: 6-Feb-23

Std Cal Due Date: 6-Feb-24

### DeltaCal:

Barometric pressure (set): 617.80 mmHg

### Results of Venturi Calibration

Flow Rate (Q) vs. Pressure Drop ( $\Delta P$ ).

Where: Q=Lpm,  $\Delta P$ = Cm of H<sub>2</sub>O

Venturi

TE20007	Q= 3.8896	$\Delta P$ ^	0.52178	Overall Uncertainty: 0.35%
TE20005	Q= 3.89792	$\Delta P$ ^	0.52069	Overall Uncertainty: 0.35%



Mesa Labs 12100 W. 6th Ave Lakewood,  
CO 80228

NIST Traceable Calibration Facility

### As Shipped Calibration Data for DeltaCal

Unit Type: DC 1
Flow Range: 1.5-19.5 LPM
Serial No. : 172508
Firmware Version: 4.00P

Date	Technician
29Sep2023	Elsy Lasky

Ambient Pressure:	617.4	mmHg
Ambient Temperature:	22.5	°C

Range 1		Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
Venturi	TE20007	1	129.72	618.3	1.793	1.806	0.725
Type	2B	2	209.68	618.3	2.935	2.957	0.750
Flow range	1.40 - 6.0 LPM	3	273.47	618.3	3.846	3.861	0.390
		4	316.26	618.3	4.457	4.486	0.651
		5	370.40	618.3	5.231	5.246	0.287
		6	419.18	618.3	5.927	5.917	-0.169
Maximum allowable error at any flow rate is 0.75%.						Average	0.439
						Result	PASS

Range 2		Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
Venturi	TE20005	1	134.46	618.3	6.501	6.500	-0.015
Type	1B	2	205.64	618.3	10.022	9.949	-0.728
Flow range	6 - 30.00 LPM	3	266.74	618.3	13.044	12.989	-0.422
		4	326.23	618.3	15.987	15.942	-0.281
		5	367.09	618.3	18.009	17.976	-0.183
		6	404.15	618.3	19.842	19.846	0.020
Maximum allowable error at any flow rate is 0.75%.						Average	-0.268
						Result	PASS

Performed By: Elsy Lasky

Date: 29-Sep-2023

Approved By:

Leonard Reinert  
Quality Specialist

Date: 29Sep2023



Mesa Labs 12100 W. 6th Ave Lakewood,  
CO 80228

NIST Traceable Calibration Facility

### As-Found data for DeltaCal

Unit Type: DC 1
Flow Range: 1.5-19.5 LPM
Serial No. : 172508
Firmware Version: 4.00P

Date	Technician
29Sep2023	Elsy Lasky

Ambient Pressure:	617.4	mmHg
Ambient Temperature:	22.5	°C

	As Received Temp. Press. Calibration				As Shipped Temp. Press. Calibration			
	DUT	Standard	Diff	+/- 1 mmHg	DUT	Standard	Diff	+/- 1 mmHg
Pres <sub>AMB</sub> mmHg	617.8	617	0.8	Pass	618.3	617.4	0.9	Pass
	DUT	Standard	Diff	+/- 1 °C	DUT	Standard	Diff	+/- 1 °C
Temp <sub>AMB</sub> °C	22.9	22.2	0.7	Pass	23.2	22.5	0.7	Pass
Temp <sub>Filter</sub> °C	22.2	22.2	0	Pass	22.5	22.5	0	Pass
	Offset	New Offset						
Pres <sub>AMB</sub>	0.84	0.04						
Temp <sub>AMB</sub>	0.82	0.12						
Temp <sub>Filter</sub>	0	0						

Range 1		Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
Venturi	TE20007	1	132.06	617.8	1.718	1.989	15.774
Type	2B	2	198.75	617.8	3.019	2.925	-3.114
Flow range	1.40 - 6.0 LPM	3	263.00	617.8	3.722	3.844	3.278
		4	318.07	617.8	4.532	4.589	1.258
		5	367.46	617.8	5.330	5.283	-0.882
		6	417.45	617.8	5.946	5.989	0.723
Maximum allowable error at any flow rate is 0.75%.						Average Result	2.840 FAIL

Range 2		Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
Venturi	TE20005	1	133.12	617.8	6.438	6.460	0.342
Type	1B	2	204.25	617.8	9.958	9.892	-0.663
Flow range	6 - 30.00 LPM	3	266.20	618.3	13.014	12.848	-1.276
		4	328.05	618.3	16.072	15.819	-1.574
		5	372.08	618.3	18.249	17.947	-1.655
		6	411.10	618.3	20.179	19.872	-1.521
Maximum allowable error at any flow rate is 0.75%.						Average Result	-1.058 FAIL







Thai Environmental Technic Limited  
บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด

### PM-2.5 Calibration Report

Equipment Name	: PM 2.5	Ambient Temperature	: 32 °C
Manufacturer	: BGI By Mesa Lab	Relative Humidity	: 55.0%RH
Model	: PQ200	Barometric	: 758.9 mm Hg
Serial Number	: 72477	Calibration Date	: 3-May-24
ID. Number	: 04	Due Date of Calibrate	: 3-May-25

### Reference Standards

Equipment Name	Model	Serial No.	Certificate No.	Due. Date
Multi-Tube Automatic Gas Calibrator	Delta Cal DC1	172508	FM-00266 Rev E	29-Sep-23

### System Flow Performance Test ( Unit : l/min )

STD Setting	UUC Reading	Error	(±) Uncertainty
15.00	15.01	0.00	0.01
16.70	16.70	0.00	0.00
18.40	18.02	0.00	0.01

### System Temperature Performance Test ( Unit : °C )

STD Setting	UUC Reading	Error	(±) Uncertainty
25	25.00	0.00	0.01
28	28.01	0.00	0.01
32	32.01	0.00	0.01

### Barometric Pressure Test ( Unit : mmHg )

STD Setting	UUC Reading	Error	(±) Uncertainty
758.9	758.90	0.00	0.03

Calibration by : [Signature]

Calibration Officer

Approved by : [Signature]

Authorized Signatory





Thai Environmental Technic Limited  
บริษัท เทคนิคสิ่งแวดล้อมไทย จำกัด

### PM-2.5 Calibration Report

Equipment Name	: PM 2.5	Ambient Temperature	: 32 °C
Manufacturer	: BGI By Mesa Lab	Relative Humidity	: 55.0%RH
Model	: PQ200	Barometric	: 758.2 mm Hg
Serial Number	: 72614	Calibration Date	: 2-May-24
ID. Number	: 07	Dued Date of Calibrate	: 2-May-25

### Reference Standards

Equipment Name	Model	Serial No.	Certificate No.	Due. Date
Multi-Tube Automatic Gas Calibrator	Delta Cal DC1	172508	FM-00266 Rev E	29-Sep-23

### System Flow Performance Test ( Unit : l/min )

STD Setting	UUC Reading	Error	(±) Uncertainty
15.00	15.02	0.01	0.02
16.70	16.70	0.00	0.01
18.40	18.41	0.00	0.01

### System Temperature Performance Test ( Unit : °C )

STD Setting	UUC Reading	Error	(±) Uncertainty
25	25.02	0.00	0.04
28	28.06	0.00	0.09
32	32.02	0.00	0.04

### Barometric Pressure Test ( Unit : mmHg )

STD Setting	UUC Reading	Error	(±) Uncertainty
758.2	758.20	0.00	0.07

Calibration by : [Signature]

Calibration Officer

Approved by : [Signature]

Authorized Signatory



# Certificate Of Analysis

## Special Gases Mixture

## Customer Details

Name:

Thai Environmental Technic Limited

Address:

1/6 Soi Ramkhamhaeng 45, Sapansoong,  
Khet Saphan Sung, Bangkok 10240

Customer Tag No.:

## Certificate Details

Number:

1734/23

Date of Issue:

5-Jul-2023

Expiry date:

5-Jul-2026

Material Details

Production Order:

90178560

Material Code:

640300-SK-44

Cylinder No.:

A00917SK

Gas content:

5.520 M<sup>3</sup>

Filling pressure:

145.0 bar

Valve:

CGA 660 SS

Cylinder Owner:

LINDE

Cylinder Material:

Spectra seal

Cylinder Size:

40 L

## Laboratory Report

## Analytical Result

Component	Nominal Concentration	Analysis Result <sup>1</sup>	Uncertainty <sup>2</sup>	Method of Analysis <sup>3</sup>	Assay Date
Nitric Oxide	40.0 ppm	40.5 ppm	± 1% relative	(6) I-PB-352	28-Jun & 5-Jul-2023
Other NOx impurity In Nitrogen		Less than 2.0 ppm			

## Reference Standard used in Assay

Reference Standard

Nitric Oxide

In Nitrogen

Cylinder number

2580135G

Concentration

25.32 ± 0.25 ppm

Expiry date:

13-Dec-2024

## Analytical Instruments used in Assay

Instrument/Make/Model

FTIR Spectrometers Nicolet i550

Analytical Principle

FTIR-NO

Last Multipoint Calibration

28-Jun-2023

## Recommend usage condition

Minimum utilization: 5% of actual content or before expire date whichever comes first.

Storage condition: Keep in well ventilation and secure area.

## Comments

When reordering, please quote the material number

## Note:

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

Page 1 of 1

This report shall not be reproduced except in full

บริษัท ลินด์ (ประเทศไทย) จำกัด (มหาชน)

โทรสาร (66) 2338-6100

โทรสาร (66) 2338-6100 โทรสาร (66) 2338-6333

โทรสาร (66) 2338-6100 โทรสาร (66) 2338-6333

โทรสาร (66) 2338-6100 โทรสาร (66) 2338-6333

โทรสาร (66) 2338-6100 โทรสาร (66) 2338-6333

Sukanya Parinyasontorn

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

PB-002/F106

Iss. 1/2, 15 Oct 2021

Linde (Thailand) Public Company Limited

PLC Registration No. 0107537000785

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

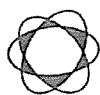
Bangplee, Samutprakarn 10540, Tel (66) 2338-6100 Fax (66) 2338-6333

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

Thailand, Tel (66) 38.570-479-93 Fax (66) 38.570-323







Thai Environmental Technic Limited  
บริษัท เทคโนโลยีสิ่งแวดล้อมไทย จำกัด

## NOx Analyzer Calibration Report

Calibrate Date : 7-Oct-24  
Analyzer Type : NOx  
Brand : Teledyne  
Model : T200  
Serial Number : 5158 (No. 31)  
Range : 500 ppb

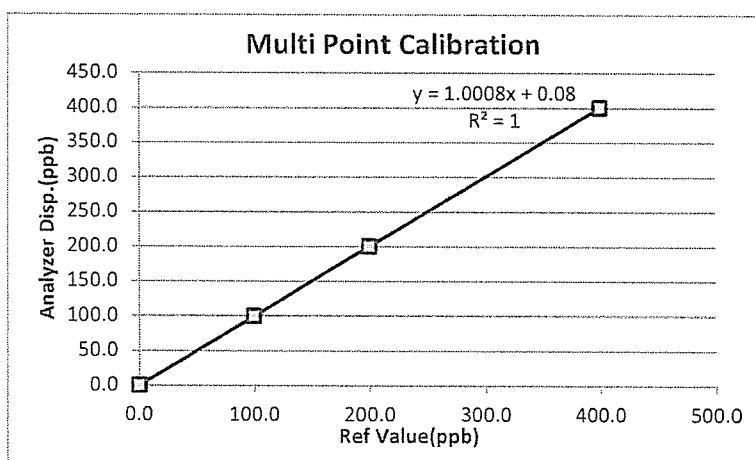
Temperature (°C) : 25°C  
Barometer (mmHg) : 760.0  
Humidity (50±15 %) : 50.0%RH  
Dilutor : API M700 S/N 625  
Zero Air : API M701 S/N 1926  
Standard gas : A00917 SK

### Calibration of Span

Supply Gas	Ref Value(ppb)	Before of Span(ppb)			After of Span(ppb)			% diff of Span
		NOx	NO	NO <sub>2</sub>	NOx	NO	NO <sub>2</sub>	
Zero	0.0	0.9	0.4	0.5	0.0	0.0	0.0	0.0
Span	400.0	384.0	385.0	-1.0	400.0	400.0	0.0	0.0

### Multi Point Calibration

Ref Value(ppb)	Analyzer Disp.(ppb)			Output Difference		
	NOx	NO	NO <sub>2</sub>	Diff(ppb)	% Diff	Abs (%) Diff
0.0	0.4	0.3	0.1	0.30	0.001	0.08
100.0	99.8	99.7	0.1	-0.30	-0.003	0.30
200.0	201.1	200.5	0.6	0.50	0.003	0.25
400.0	401.2	400.4	0.8	0.40	0.001	0.10
Average Diff (%)						0.22



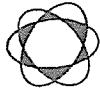
Calibrate by:

*[Signature]*

Approved by:

*[Signature]*





Thai Environmental Technic Limited  
บริษัท เทคโนโลยีสิ่งแวดล้อมไทย จำกัด

## NOx Analyzer Calibration Report

Calibrate Date : 8-Oct-24  
Analyzer Type : NOx  
Brand : Teledyne  
Model : 200 E  
Serial Number : 1173 (No. 35)  
Range : 500 ppb

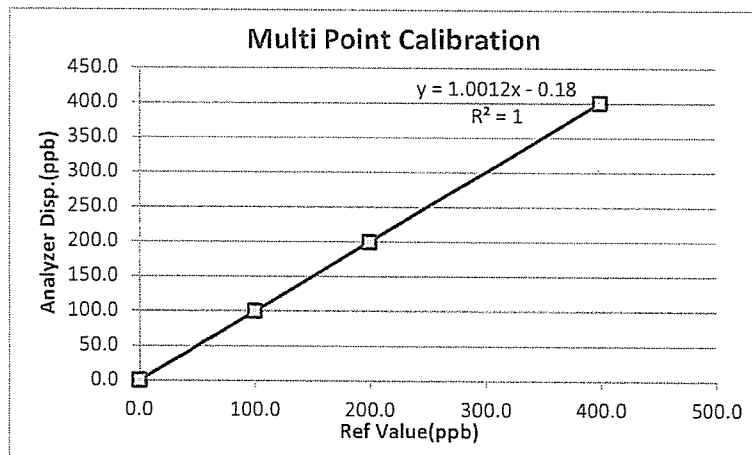
Temperature (°C) : 25 °C  
Barometer (mmHg) : 759.1  
Humidity (50±15 %) : 50.0%RH  
Dilutor : API M700 S/N 625  
Zero Air : API M701 S/N 1926  
Standard gas : A00917 SK

### Calibration of Span

Supply Gas	Ref Value(ppb)	Before of Span.(ppb)			After of Span.(ppb)			% diff of Span
		NOx	NO	NO <sub>2</sub>	NOx	NO	NO <sub>2</sub>	
Zero	0.0	2.9	0.0	2.9	0.0	0.0	0.0	0.0
Span	400.0	360.0	361.0	-1.0	400.0	400.0	0.0	0.0

### Multi Point Calibration

Ref Value(ppb)	Analyzer Disp.(ppb)			Output Difference		
	NOx	NO	NO <sub>2</sub>	Diff(ppb)	% Diff	Abs (%) Diff
0.0	0.3	0.1	0.2	0.10	0.000	0.03
100.0	101.3	99.8	1.5	-0.20	-0.002	0.20
200.0	200.4	199.7	0.7	-0.30	-0.002	0.15
400.0	401.0	400.5	0.5	0.50	0.001	0.13
Average Diff (%)						0.13



Calibrate by:

*[Signature]*

Approved by:

*[Signature]*



## Certificate Of Analysis

### Special Gases Mixture

**Customer Details**

Name:	Address:	Customer Tag No.:
Thai Environmental Technic Limited.	1/6 Soi Ramkhamhaeng 45, Sapansoong, Khet Saphan Sung, Bangkok 10240	-

**Certificate Details**

Number:	2500/23	Date of Issue:	18-Sep-2023	Expiry date:	18-Sep-2027
<b>Material Details</b>					
Production Order:	90179846	Material Code:	608400-SK-44	Cylinder No.:	D636157
Gas content:	5.520 M <sup>3</sup>	Filling pressure:	145 bar	Valve:	CGA 660 SS
Cylinder Owner:	LINDE	Cylinder Material:	Spectra seal	Cylinder Size:	40 L

**Laboratory Report***Analytical Result*

Component	Nominal Concentration	Analysis Result <sup>1</sup>	Uncertainty <sup>2</sup>	Method of Analysis <sup>3</sup>	Assay Date
Sulphur Dioxide In Nitrogen	40.0 ppm	41.1 ppm	± 1% relative	(6) I-PB-352	8-Sep & 18-Sep-23

*Reference Standard used in Assay*

Reference Standard	Cylinder number	Concentration	Expiry date:
Sulphur Dioxide In Nitrogen	BOC150629SG	25.35 ± 0.25 ppm	9-Jun-2024

*Analytical Instruments used in Assay*

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
FTIR Spectrometers Nicolet iS50	FTIR-SO2	6-Sep-2023

**Recommend usage condition**

Minimum utilization: 5% of actual content or before expire date whichever comes first.


Storage condition: Keep in well ventilation and secure area.

**Comments**

When reordering, please quote the material number

**Note:**

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

  
 Sukanya Parinyasontorn

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

PB-002/F006

Iss: L/2, 01 August 2023

บริษัท ลินด์ (ประเทศไทย) จำกัด (มหาชน)

เลขที่ใบอนุญาตประกอบกิจการ 0107537000785

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

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

โรงงานเวลโกรว์: 105 หมู่ 5 ต.บางสมัคร อ.บางปะกง จ.ฉะเชิงเทรา 24180

โทรศัพท์ (66) 38.570-479-93

โทรสาร (66) 38.570-323

Linde (Thailand) Public Company Limited

PLC Registration no. 0107537000785

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

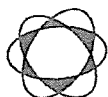
Bangplee, Samutprakarn 10540, Tel (66) 2338-6100 Fax (66) 2338-6333

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

Thailand, Tel (66) 38.570-479-93

Fax (66) 38.570-323





Thai Environmental Technic Limited  
บริษัท เทคโนโลยีสิ่งแวดล้อมไทย จำกัด

## Analyzer Calibration Report

Calibrate Date : 2-Oct-24  
Analyzer Type : SO<sub>2</sub>  
Brand : Teledyne  
Model : 100 E  
Serial Number : 064 (No. 24)  
Range : 500 ppb

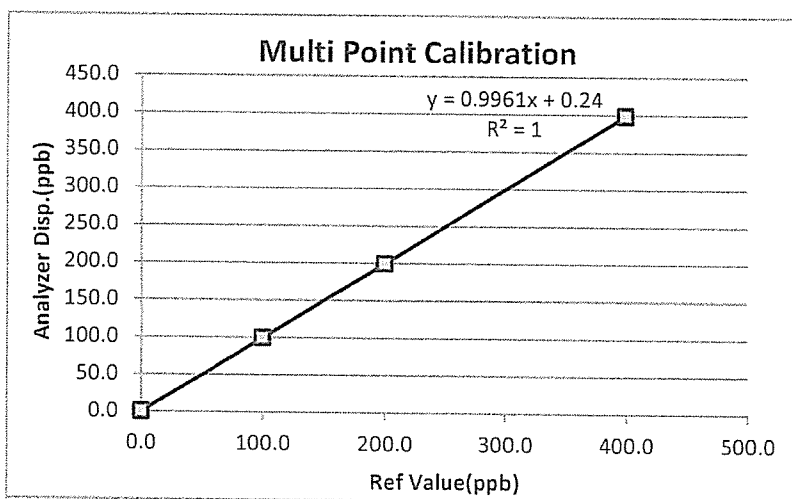
Temperature (°C) : 25°C  
Barometer (mmHg) : 758.2  
Humidity (50±15 %) : 52.0 %RH  
Dilutor : API M700 S/N 625  
Zero Air : API M701 S/N 1926  
Standard gas : D636157

### Calibration of Span

Supply Gas	Ref Value(ppb)	Before of Span.(ppb)	After of Span.(ppb)	Abs% diff of Span
Zero	0.0	0.9	0.0	0.0
Span	400.0	417.0	400.0	0.0

### Multi Point Calibration

Ref Value(ppb)	Analyzer Disp.(ppb)	Output Difference		
		Diff (ppb)	Percent Diff	Abs Percent Diff
0.0	0.3	0.3	0.00	0.08
100.0	99.8	-0.2	0.00	0.20
200.0	199.4	-0.6	0.00	0.30
400.0	398.7	-1.3	0.00	0.33
Average Diff (%)				0.23



Calibrate by:

*[Signature]*

Approved by:

*[Signature]*

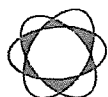
แก้ไขครั้งที่ : 00

วันที่อนุมัติ 02/09/15

เลขที่แบบฟอร์ม : QF-QP16-06







Thai Environmental Technic Limited  
บริษัท เทคโนโลยีสิ่งแวดล้อมไทย จำกัด

## Analyzer Calibration Report

Calibrate Date 4-Oct-24  
Analyzer Type SO<sub>2</sub>  
Brand Teledyne  
Model 100 E  
Serial Number 110 (No. 21)  
Range 500 ppb

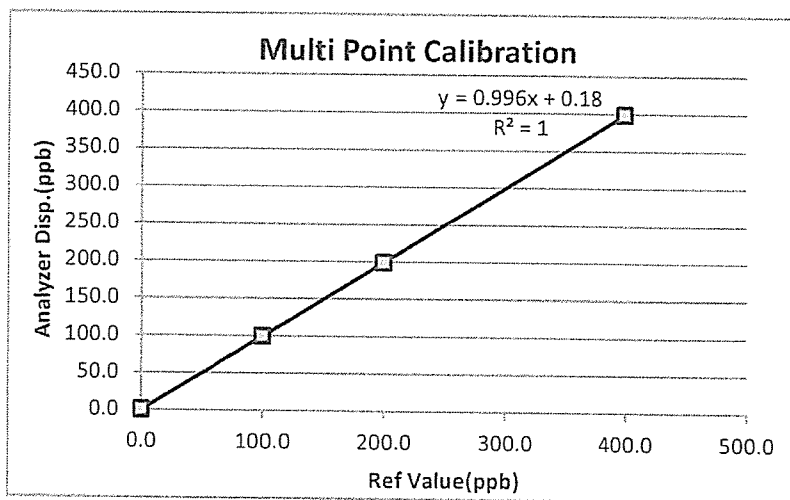
Temperature (°C) : 25°C  
Barometer (mmHg) : 760.0  
Humidity (50±15 %) : 50.0 %RH  
Dilutor : API M700 S/N 625  
Zero Air : API M701 S/N 1926  
Standard gas : D636157

### Calibration of Span

Supply Gas	Ref Value(ppb)	Before of Span.(ppb)	After of Span.(ppb)	Abs% diff of Span
Zero	0.0	5.3	0.0	0.0
Span	400.0	429.0	400.0	0.0

### Multi Point Calibration

Ref Value(ppb)	Analyzer Disp.(ppb)	Output Difference		
		Diff (ppb)	Percent Diff	Abs Percent Diff
0.0	0.3	0.3	0.00	0.08
100.0	99.8	-0.2	0.00	0.20
200.0	199.1	-0.9	0.00	0.45
400.0	398.7	-1.3	0.00	0.33
Average Diff (%)				0.26



Calibrate by:

*[Signature]*

Approved by:

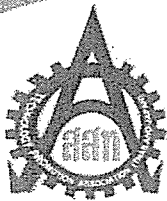
*[Signature]*

แก้ไขครั้งที่ : 00

วันที่อนุมัติ 02/09/15

เลขที่แบบฟอร์ม : QF-QP16-06





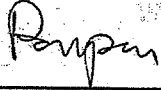
TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES  
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250  
TEL.0-2717-3000-29 FAX.0-2719-9484



## Certificate of Calibration

Cert.No.: 24CHO573

Page.: 1 of 2

Equipment : pH Meter  
Manufacturer : Horiba  
Model : F-71G  
Serial No. : V3B1F8H3  
ID No. : Ins-LAB-025  
Condition As-Received: Used Item  
Received Date : 30 October 2024  
Calibration Date : 31 October 2024  
Reference : 2410-0784OC-1  
Submitted by : Thai Environmental Technic Limited  
1/6 Soi Ramkhamhaeng 145,  
Khwaeng/Khet Saphan Sung,  
Bangkok 10240  
Calibration Place : Laboratory (Thai Environmental Technic Limited)  
Ambient Temperature : ( 26.1 to 25.8 ) °C (On-Site)  
Relative Humidity : ( 58.6 to 64.2 ) % (On-Site)  
Calibration Procedure : In - house method :  
- CP-OCH2 by direct measurement with DC voltage  
standard and direct measurement with  
certified reference material (CRM)  
Calibrated by : Saithip Meangmai  
Approved by :   
Approved Signatory  
( ) Unnopphol Harachai  
(✓) Ponpan Paipim  
( ) Saithip Meangmai  
Issue Date : 2 November 2024

**The Uncertainties are for a confidence probability of approximately 95%**

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



Cert.No.: 24CHO573

Page.: 2 of 2

**Condition of this calibration result**

1. Reference Standard Instrument

<u>Instrument</u>	<u>Serial No.</u>	<u>ID No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
1) Document Process Calibrator	46530031	130RC098	24E3004	12 Sep 2025
2) Digital Thermometer	307901	70RC137	24I973	01 Sep 2025

- This Certification is traceable to SI Through Technology Promotion Association (Thailand - Japan)

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

<u>Buffer Solution</u>	<u>Manufacturer</u>	<u>Lot No.</u>	<u>Exp. date</u>
pH 4.008	CPA chem	1034203	27 Sep 2026
pH 6.876	CPA chem	1005301	15 June 2026
pH 9.174	CPA chem	1005302	15 June 2025

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

**Calibration Results**

**Function : mV Measurement**

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

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement ( $\pm$ mV)	Coverage factor <i>k</i>
	pH	mV	mV	pH		
pH Meter S/N.: V3B1F8H3	4.000	177.48	177.5	4.000	0.058	2.00
	6.860	8.28	8.3	6.860	0.058	2.00
	7.000	0.00	0.0	7.000	0.058	2.00
	9.180	-128.97	-128.9	9.180	0.058	2.00
	10.000	-177.48	-177.4	10.000	0.058	2.00

**Function : pH Measurement**

Performing three buffers standard curve by using buffer nominal pH (4,7,9)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement ( $\pm$ )	Coverage factor <i>k</i>
pH Electrode S/N.: 9X2E0223	4.008	4.007	167.0	0.0048	2.00
	6.876	6.855	-0.3	0.0065	2.00
	9.174	9.158	-136.6	0.0096	2.00

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

-o0o-



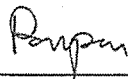
TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES  
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250  
TEL.0-2717-3000-29 FAX.0-2719-9484



## Certificate of Calibration

Cert.No.: 24CHO222

Page.: 1 of 3

Equipment : Spectrophotometer  
Manufacturer : Labtech  
Model : Blue Star A  
Serial No. : 1606UV1507  
ID No. : Ins-LAB-004  
Condition As-Received: Used Item  
Received Date : 09 April 2024  
Calibration Date : 09 April 2024  
Reference : 2404-0113OC-2  
Submitted by : Thai Environmental Technic Limited  
1/6 Soi Ramkhamhaeng 145,  
Khwaeng/Khet Saphan Sung,  
Bangkok 10240  
Calibration Place : Laboratory ( Thai Environment Technic Limited)  
Ambient Temperature : ( 29.2 - 31.4 ) °C (On-Site)  
Relative Humidity : ( 45.2 - 40.3 ) % (On-Site)  
Calibration Procedure : In - house method :  
CP-OCH4 based on ASTM E 275-01  
Calibrated by : Saithip Meangmai  
Approved by :   
Approved Signatory  
( ) Unnopphol Harachai  
(✓) Ponpan Paipim  
( ) Saithip Meangmai  
Issue Date : 17 April 2024

**The Uncertainties are for a confidence probability of approximately 95%**

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



Cert. No. : 24CHO222

Page : 2 of 3

**Condition of calibration result**

1. Reference Standard Material :

<u>Material</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due date</u>
1. Absorbance Standard set	42527	116226	08 Nov 2025
2. Wavelength Standard set	29829	114509	11 Sep 2025
3. Wavelength Standard set	29829	114510	11 Sep 2025
4. Stray Light Standard set	14004	108964	01 Feb 2025

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

3. This certificate is traceable to the International System of Unit maintained through :

- Starna Scientific Ltd.

4. Spectral BandWidth : 2 nm

Scan Speed : Slow

**Calibration Results : without adjustment**

**Wavelength Accuracy**

<b>Certified Values of Reference Material ( nm )</b>	<b>UUC Reading ( nm )</b>	<b>Uncertainty of Measurement ( <math>\pm</math> nm )</b>	<b>Coverage Factor <i>k</i></b>
361.00	360.6	0.16	2.00
472.47	471.6	0.16	2.00
536.66	536.2	0.16	2.00
748.48	748.4	0.16	2.00
879.27	879.0	0.16	2.00



Cert. No. : 24CHO222

Page : 3 of 3

**Calibration Results** : without adjustment

**Photometric Accuracy**

Wavelength (nm)	Certified Values of Reference Material ( Abs )	UUC Reading ( Abs )	Uncertainty of Measurement ( $\pm$ Abs )	Coverage Factor <i>k</i>
420.0	Zero	0.0002	0.0028	2.00
	0.5739	0.5722	0.0028	2.00
	0.7085	0.7074	0.0030	2.00
	1.0169	1.0146	0.0028	2.00
546.1	Zero	-0.0001	0.0028	2.00
	0.5214	0.5211	0.0028	2.00
	0.6935	0.6926	0.0030	2.00
	0.9978	0.9960	0.0028	2.00
635.0	Zero	0.0000	0.0028	2.00
	0.5626	0.5623	0.0028	2.00
	0.7577	0.7570	0.0030	2.00
	1.0946	1.0927	0.0028	2.00

**Stray Light**

* Straylight at 260.49 nm $\pm$ 0.11 nm	Reading at 260.49 nm $\pm$ 0.11 nm
Abs	2.2284
%T	0.57

**Remark**

- Each individual filter is measured against the empty filter holder (blank) used to zero the spectrophotometer
- Cut-off wavelength of stray light reference material (Potassium Iodide) at Wavelength
- Result = Pass, If Absorbance > 2.00 Abs and Transmission < 1.0 %T at Wavelength
- \* : Not NSC-ONSC Accredited

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







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



## Certificate of Calibration

Cert.No.: 24MM272

Page.: 1 of 3

**Equipment :** Electronic Balance

**Manufacturer :** Mettler Toledo

**Model :** AB204

**Serial No. :** 1116392227

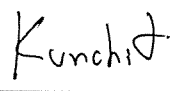
**ID No. :** Ins-LAB-033

**Submitted by :** Thai Environmental Technic Limited  
1/6 Soi Ramkhamhaeng 145,  
Khwaeng/Khet Saphan Sung,  
Bangkok 10240

**Location :** Balance Room

**Received order :** 09 April 2024  
**Calibration Date :** 10 April 2024  
**Ambient Temperature :** 15 °C to 40 °C  
**Relative Humidity :** 30 % to 90 %

**Calibrated by :** Khit Ruttanaprapachai

**Approved by :**   
Approved Signatory

( ) Ponpan Paipim  
( ) Suwit Imjai  
(✓) Kunchit Promprat

**Issue Date :** 12 April 2024

**The Uncertainties are for a confidence probability of approximately 95%**

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



Equipment : Electronic Balance  
Condition As-Received : Used Item  
Reference : 2404-0113OC-14

Cert.No.: 24MM272

Page: 2 of 3

**Procedure used :-**

Calibration were conducted using in-house calibration procedure CP-OB01 based on UKAS LAB 14 according to direct measurement method against standard weight.

**Condition of this result of calibration**

1. Reference standard instruments:-

<u>Instruments</u>	<u>Model</u>	<u>Serial No.</u>	<u>ID No.</u>	<u>Test report No.</u>	<u>Due date</u>
1) Standard Weight Set (E2)	15884	-	70RC138	MM-0020-23	30 Jan 2025

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

3. This result of calibration was made on requested at the point specified by customer.

4. This certificate is not certified for any commercial transaction.

5. This certification is traceable to the International System of Unit.

**Result of calibration** ( ) Without Adjustment ( \* ) After Adjustment by External Calibration

**Range capacity :** 0 g to 210 g **Resolution** 0.0001 g

**Before Adjustment :**

<u>Applied Weight</u>	<u>Balance Reading</u>	<u>Correction</u>	<u>Measurement Uncertainty</u>	<u>Coverage Factor</u>
( g )	( g )	( g )	( ± mg )	( k )
100	100.0000	0.0000	0.19	2
200	200.0001	-0.0001	0.30	2

**After Adjustment :**

1. **Determination of the standard deviation of weighing machine** ( n = 10 )

<u>Applied Weight</u>	<u>Standard Deviation of Reading ( g )</u>
( g )	
100	0.00007
200	0.00008



Equipment : Electronic Balance  
Condition As-Received : Used Item  
Reference : 2404-0113OC-14

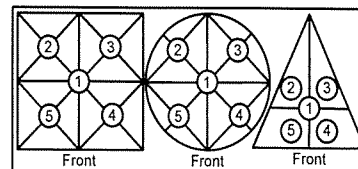
Cert.No.: 24MM272

Page: 3 of 3

### Result of calibration

#### 2. Effect of off center loading

A mass of 100 g was placed at various positions on the pan.  
The weighing machine reading error obtained is given in the table



Maximum difference between  
off-center and central loading  
( g )  
0.0003

Position 1 ( g )	Position 2 ( g )	Position 3 ( g )	Position 4 ( g )	Position 5 ( g )
0.0000	+0.0001	0.0000	+0.0001	+0.0003

#### 3. Departure from nominal value

Applied Weight ( g )	Balance Reading ( g )	Correction ( g )	Measurement Uncertainty ( ± mg )	Coverage Factor ( k )
Unload	0.0000	0.0000	0.14	2.11
0.01	0.0101	-0.0001	0.14	2.11
0.1	0.1001	-0.0001	0.14	2.11
0.5	0.5002	-0.0002	0.14	2.11
1	1.0002	-0.0002	0.14	2.11
5	5.0000	0.0000	0.14	2.11
10	10.0001	-0.0001	0.14	2.11
25	25.0000	0.0000	0.15	2.07
50	49.9999	+0.0001	0.15	2.06
100	100.0002	-0.0002	0.19	2
200	200.0002	-0.0002	0.30	2

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

-o0o-





## Certificate of Calibration

Certificate Number : SPR24020097-8

Page : 1 of 3

Customer : Thai Environmental Technic Limited.

1/6 Soi Ramkhamhaeng 145, Khwaeng Saphan Sung, Khet Saphan  
Sung, Bangkok 10240, Thailand.

Equipment Name : DO Meter

Manufacturer : Horiba

Model : OM-71G

Serial Number : D75J0012

ID. Number : No.07

### Environmental Conditions

Ambient Temperature :  $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$  Received Date : 07 Feb 2024

Relative Humidity :  $50\% \pm 15\%$  Calibration Date : 09 Feb 2024

Location of Calibration : In-Lab Recommend Due Date : 09 Feb 2025

Calibration Procedure : In-House Method Date of Issue : 10 Feb 2024

### Method of Calibration

This certifies that the above instrument was calibrated in compliance with the calibration system requirement of ISO/IEC 17025:2017 in accordance with reference procedure. Standards used to perform this calibration are certified by to NIST or equivalent, National metrology institute, Natural physical constants, consensus standards. The result reported herein apply only to the calibration of the item described above as received. Our decision rule is to contact the customer if the item pass and fail calibration when the results include the uncertainties and the customer must determine if the results meets their needs.

The calibration certificate shall not be reproduced except in full, without written approval of SP Metrology System (Thailand).

Calibrated by : Mr.Sarawut Khitmai

Calibration Officer

Approved by :

( Mr.Yodyaim Chansang )

Authorized Signatory





## Result of Calibration

Certificate Number : SPR24020097-8

Page : 3 of 3

Function : Dissolved Oxygen Permanance Test

Unit : mg/L

Actual Standard	UUC Reading	Error	Uncertainty ( ± )
0.00	0.34	0.34	0.13
8.24	8.72	0.48	0.13

### Note :

The result of calibration was found accurate as show on date and place of calibration only.  
This Certificate is not certified for any commercial transaction.

### Measurement Uncertainty

The reported uncertainty of measurement is the expanded uncertainty obtained by multiplying the standard uncertainty with the coverage factor  $k = 2.00$ , providing a level of confidence approximately 95%.

- End of Certificate -







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



## Certificate of Calibration

Cert. No.: 24TM702

Page : 1 of 3

Equipment : BOD Incubator

Manufacturer : Accuplus

Model : i250

Serial No. : 0408-0115-0008

ID No. : Ins-LAB-046

Submitted by : Thai Environmental Technic Limited  
1/6 Soi Ramkhamhaeng 145,  
Khwaeng/Khet Saphan Sung,  
Bangkok 10240

Location : Laboratory (Thai Environmental Technic Limited)

Received Order : 09 April 2024

Calibration Date : 09 April 2024

Ambient Temperature : (  $26 \pm 10$  ) °C

Relative Humidity : (  $50 \pm 30$  ) %

Calibrated by : Khit Ruttanaprapachai

Approved by :

Kunchit

Approved Signatory

- ( ) Ponpan Paipim  
( ) Suwit Imjai  
(✓) Kunchit Promprat

Issue Date : 26 April 2024

**The Uncertainties are for a confidence probability of approximately 95%**

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



**Equipment :** BOD Incubator  
**Condition As-Received :** Used Item  
**Reference :** 2404-0113OC-11  
**Procedure Used :-**

**Cert. No.:** 24TM702  
**Page :** 2 of 3

Calibration were conducted using calibration procedure CP-OT02 based on TLAS G-20 according to direct measurement method with Data Acquisition which connected with Resistance Temperature Detector ( RTD ).  
 The temperature scale used was based on ITS-90.

**Condition of this result of calibration**

1. Reference standard instrument:-

<u>Instrument</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Traceable</u>	<u>Due Date</u>
1 ) Data Acquisition	MY49001451	24LM44	TPA	17 Mar 2025

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

3. This certification is traceable to the International System of Unit.

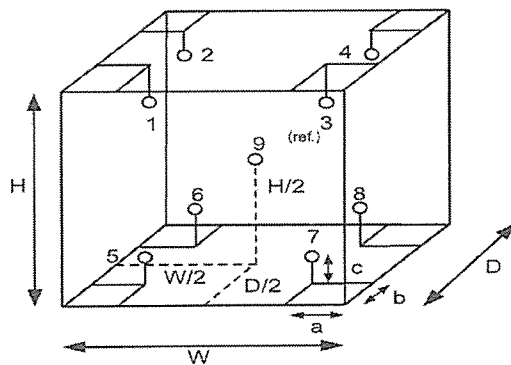
**Remark :** TPA : Technology Promotion Association ( Thailand - Japan )

**Result of Calibration :-** ( \* ) Without Adjustment

**Function of UUC\* :** Temperature Source

**Fresh air setting :** Not Available

Environment during calibration		
	Beginning	Finished
Temp. ( °C )	24	25
REL.Humid. ( % )	50	52
AC Supply ( Volt )	221	220



Position :	Ref. Std. ID No.:
1	19RTD-2/1
2	19RTD-2/2
3	19RTD-2/3
4	19RTD-2/4
5	19RTD-2/5
6	24-19RTD-2/6
7	19RTD-2/7
8	19RTD-2/8
9 (ref.)	19RTD-2/9

**Probe Installation Details :**

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

**Dimension of Chamber :**

D = 0.48 m  
 W = 0.50 m  
 H = 1.1 m  
 Capacity = 0.26 m<sup>3</sup>



**Equipment :** BOD Incubator  
**Condition As-Received :** Used Item  
**Reference :** 2404-0113OC-11  
**Result of Calibration :-** ( \* ) Without Adjustment  
**Function of UUC\* :** Temperature Source  
**Fresh air setting :** Not Available

**Cert. No.:** 24TM702

**Page :** 3 of 3

Calibration Point ( °C )	UUC* Setting ( °C )	UUC* Reading ( °C )	Temperature stability ( ± °C )	Temperature uniformity ( °C )	Overall Variation ( °C )	Coverage Factor <i>k</i>
20.0	20.0	20.0	0.30	0.27	0.77	2

Calibration Point ( °C )	Measured Temperature ( °C )									Uncertainty
	Position									
	1	2	3	4	5	6	7	8	9 (ref.)	( ± °C )
20.0	20.232	20.184	20.129	20.214	20.126	20.102	19.987	20.053	20.128	0.49

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

**Temperature stability :** One-half of the greatest maximum difference of measured temperature at any one sensor.

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

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

**UUC\* :** Unit Under Calibration

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

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

-o0o-



# INSTALLATION PERFORMANCE VERIFICATION REPORT

## ATOMIC ABSORPTION SPECTROPHOTOMETER MODEL

### PinAAcle 900Z

<b>Customer :</b> <u>Thai Environmental</u> <u>Technic Limited.</u> <b>Address :</b> <u>1/6Soi Ramkhamhaeng 145</u> <u>Khwaeng,Khet Saphan Sung</u> <u>Bangkok 10240</u> <b>User Name:</b> <u>K.Pornthip</u> <b>Phone:</b> <u>092-415-0808</u> <b>Fax:</b> <u>02-373-7979</u>	<b>Date Tested:</b> <u>December 27, 2023</u> <b>Recommendation Recertification</b> <b>Period</b> <u>12</u> <b>Months</b> <b>Recertification Due:</b> <u>December 27, 2024</u> <b>Date Last Certified:</b> <u>NA</u> <b>Visit Number:</b> <u>1 of 1</u> <b>PerkinElmer Phone:</b> <u>02-719-6420 ext 206</u> <b>PerkinElmer Fax:</b> <u>02-318-5597</u>
--	---

CONFIGURATION TESTED		
<b>MODEL</b> <u>PinAAcle 900Z</u> <hr/> <hr/> <hr/> <hr/>	<b>SERIAL NUMBER</b> <u>PZBS23100902</u> <hr/> <hr/> <hr/> <hr/>	<b>SOFTWARE</b> <u>Syngistix for AA 5.0.1</u> <hr/> <hr/> <hr/> <hr/>
<b>TEST STANDARD USED</b> <u>GFAAS Mixed standard</u> <hr/> <hr/> <hr/> <hr/>	<b>PART NUMBER</b> <u>N9300244</u> <hr/> <hr/> <hr/> <hr/>	<b>EXPIRATION DATE</b> <u>FEB 28, 2025</u> <hr/> <hr/> <hr/> <hr/>

# INSTALLATION PERFORMANCE VERIFICATION REPORT

## ATOMIC ABSORPTION SPECTROPHOTOMETER MODEL

### PinAAcle 900Z

SERIAL NUMBER	<u>PZBS23100902</u>		DATE TESTED	<u>December 27, 2023</u>
PARAMETER			SPECIFICATION	ACTUAL VAULE
THGA Tests				
1. Furnace Gas Flows				
	Internal Flow	250 ± 25 mL/min	<u>253</u>	mL/min
	External Flow	100 ± 10 mL/min	<u>105</u>	mL/min
2. Chromium Baseline Noise (357.87 nm)				
(mesure 5 furnace dry firings without any sample)				
		Baseline ≤ 0.005 Int.Abs	<u>-0.0002</u>	Int.Abs
		SD ≤ 0.005 Int.Abs	<u>0.0000</u>	int.Abs
3. Chromium Characteristic Mass(m <sub>0</sub> ) and Precision (357.87 nm)				
(measure 5 furnace firing using 20 ul				
sample injections of 10 ug/L Cr standard)				
		m <sub>0</sub> Results 6.5 pg ± 1.5 pg	<u>2.7</u>	pg/0.0044A-s
		Precision ≤ 2.0%	<u>0.94</u>	%
4. Copper Characteristic Mass(m <sub>0</sub> ) and Zeeman Ratio (324.75 nm)				
(measure 5 furnace firing using 20 ul				
sample injections of 25 ug/L Cu standard)				
		m <sub>0</sub> Results 14.0 pg ± 2.5 pg	<u>10.5</u>	pg/0.0044A-s
		Zeeman Ratio 0.58 ± 0.04	<u>0.551</u>	

## MAINTENANCE REPORT AND CALIBRATION CERTIFICATE

ATOMIC ABSORPTION SPECTROPHOTOMETER MODEL

PinAACle 900Z

SERIAL NUMBER PZBS23100902

DATE TESTED December 27, 2023

Remarks :

<hr/>	
Zeeman Ratio	=
Atomic Signal(peak area)	
<hr/>	
Atomic Signal(peak area)+Background Signal(peak area)	
<hr/>	
=	0.3413/(0.3413+0.2778)
<hr/>	
=	0.551
<hr/>	

This is to certify that the above tests have been performed and the configuration tested



meets



does not meet

the PerkinElmer Specifications listed on this certificate.

This certificate does not modify PerkinElmer's standard terms and condition of sale, including warranty terms.

**Service Department PerkinElmer Ltd.**

Customer Service Engineer: Piyawit Sompanithan

( Piyawit Sompanithan )

Sr.Customer Support Engineer



# PerkinElmer TruQ

Atomic Spectroscopy Standard



## Certificate of Analysis

PerkinElmer Number: N9300244

Description: GFAAS Mixed Standard

Matrix: 5% HNO<sub>3</sub> / Tr. HF / Tr. Tart. Acid

Lot Number: 60-004CRY1

Certification Date: AUG - - 2023

Expiration Date: FEB 28 2025

### \* Instrumental Analysis using ICP Spectrometer:

Analyte	Labeled	Measured	SRM	Analyte	Labeled	Measured	SRM
Al	100 µg/mL	100 µg/mL	3101a*	Cu	50.0 µg/mL	50.1 µg/mL	3114*
As	100 µg/mL	101 µg/mL	3103a*	Ni	50.0 µg/mL	50.1 µg/mL	3136*
Pb	100 µg/mL	100 µg/mL	3128*	Cr	20.0 µg/mL	20.0 µg/mL	3112a*
Sb	100 µg/mL	100 µg/mL	3102a*	Fe	20.0 µg/mL	20.0 µg/mL	3126a*
Se	100 µg/mL	100 µg/mL	3149*	Mn	20.0 µg/mL	19.9 µg/mL	3132*
Tl	100 µg/mL	98.6 µg/mL	3158*	Ag	10.0 µg/mL	9.93 µg/mL	3151*
Ba	50.0 µg/mL	50.1 µg/mL	3104a*	Be	5.00 µg/mL	5.05 µg/mL	3105a*
Co	50.0 µg/mL	49.7 µg/mL	3113*	Cd	5.00 µg/mL	5.00 µg/mL	3108*

\* - indicates NIST SRM

† - indicates CRM (when NIST SRM is not available)

Reference Multi: Lot# 58-142CR, 56-021CR

Refer to side 2 for details of certification.

Balances are calibrated with weight sets traceable to NIST.

We guarantee that our PerkinElmer TruQ Atomic Spectroscopy Standards are stable and accurate to  $\pm 0.5\%$  of certified concentration until the expiration date, provided the standards are kept tightly capped and stored under normal laboratory conditions. This value is the sum of cumulative errors associated with the analytical determinations, pipetting, and diluting to final volume. For these solutions we use high purity acids, ASTM Type I water (18 megohm double deionized), and leached, triple-rinsed bottles. All glassware used is class A.



Certifying Officer: Y. Parikh

PerkinElmer®

PerkinElmer, Inc.

U.S.A. Tel: 1-203-925-4600

U.S.A. Toll Free: 1-800-762-4000

Visit [www.perkinelmer.com/lasoffices](http://www.perkinelmer.com/lasoffices) for a complete listing of our global offices.



## *Certificate of Training*

This is to certify that

**Mr. Piyawit Sompanithan**

has successfully completed.

***AA PinAAcle 900T,H,Z,F. Service Training***

***(16 To20 September 2022)***

*Piyawit S.*

*Gary Tyson*  
Gary Tyson

INSTRUCTOR

20 September 2022

Date



Customer :	<u>บริษัท เทคนิกสิ่งแวดลอมไทย</u>	Date Tested:	<u>September 27, 2024</u>
	<u>จำกัด</u>	Recommendation Recertification	
Address :	<u>1/6 ขอยรามคำแหง 145,</u>	Period	<u>6</u> Months
	<u>แขวงสะพานสูง, เขตสะพานสูง,</u>	Recertification Due:	<u>March 26, 2568</u>
	<u>กรุงเทพฯ 10240 TH</u>	Date Last Certified:	<u>March 28, 2024</u>
User Name:	<u>คุณ ณัฐพงศ์ โคตะมา</u>	Visit Number:	<u>2 OF 2</u>
Phone:	<u>02-3737799, 081-1303495</u>	TH ONE SOURCE Phone:	<u>081-7316733, 081-1086572</u>
E-mail:	<u>Ketsarin.Chuayphan@eurofinsasia.co</u>	E-mail :	<u>thonesource@gmail.com</u>

CONFIGURATION TESTED		ACCESSORIES/COMPONENT NOT INCLUDED
MODEL	SERIAL NUMBER	
OPTIMA 8000	078S1310024C	WinLab32 Version 5.5.0
N0772045	1F1380368	PN:6150T21E4Q1E
TESTED EQUIPMENT		
IPV Methods		
TEST STANDARD USED	PE NUMBER	
Mixed standard 1/10	N0691579	
Mixed standard 1/100	N9300221	
CUSTOMER SUPPLIED	COMMENTS	
2 % HNO3		
10 % HNO3		



## MAINTENANCE REPORT

### OPTIMA 8000

SERIAL NUMBER 078S1310024C

DATE TESTED

September 27, 2024

#### 1. MECHANICAL CHECKS

- A. Inspect and clean all fans and filters.
- B. Inspect and replace as necessary, all torch components including the RF Flat coil
- C. Inspect all tubing for sign of clacking or leaking.
- D. Adjust water and gas pressure regulator settings.
- E. Inspect and leak check pneumatics drawers.
- F. Clean the exterior of the instrument.

☐ OK☐ OK☐ OK☐ OK☐ OK☐ OK

#### 2. OPTICAL CHECKS

- A. Inspect and clean all optical components.
- B. As required, check and replace all purge filters.
- C. Recheck optical alignment.

☐ OK☐ OK☐ OK

#### 3. COOLING SYSTEM CHECKS

- A. Perform preventive maintenance on chiller.
- B. Flush out water the chiller and replace with coolant mix30plus every twelve months

☐ OK☐ OK

#### 4. PERFORMANCE CHECKS

- A. Torch View Alignment.
- B. Wavelength Calibration.

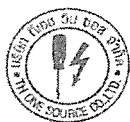
☐ OK☐ OK



## MAINTENANCE REPORT

### OPTIMA 8000

SERIAL NUMBER	<u>078S1310024C</u>	DATE TESTED	<u>September 27, 2024</u>
PARAMETER		SPECIFICATION	FINAL VAULE
Precision			
Zn 213.856		% RSD $\leq 1.0$	<u>0.80</u>
Mg 280.260		% RSD $\leq 1.0$	<u>0.65</u>
Mg 285.207		% RSD $\leq 1.0$	<u>0.96</u>
Ba 455.403		% RSD $\leq 1.0$	<u>0.39</u>
Detection Limits: Axial			
		As 193 nm, 3(sd) $\leq 10.0$ ppb	<u>8.89</u>
		Se 196 nm, 3(sd) $\leq 5.0$ ppb	<u>5</u>
		Tl 190 nm, 3(sd) $\leq 10.0$ ppb	<u>8.49</u>
		Pb 220 nm, 3(sd) $\leq 3.0$ ppb	<u>3.0</u>
BEC: Axial		Mn 257 nm, $\leq 30$ ppb	<u>3.19</u>
Detection Limits: Radial			
		As 193 nm, 3(sd) $\leq 60.0$ ppb	<u>3.05</u>
		Zn 213 nm, 3(sd) $\leq 2.0$ ppb	<u>0.11</u>
		Mn 257 nm, 3(sd) $\leq 1.0$ ppb	<u>0.03</u>
		La 379 nm, 3(sd) $\leq 3.0$ ppb	<u>0.16</u>
		Ba 455 nm, 3(sd) $\leq 0.3$ ppb	<u>0.03</u>
		Ba 493 nm, 3(sd) $\leq 0.6$ ppb	<u>0.04</u>
BEC: Radial		Mn 257 nm, $\leq 30$ ppb	<u>6.73</u>
Spectral Resolution: UV			
		As 193 nm, $\leq 0.009$	<u>0.00770</u>
		Ni 231 nm, $\leq 0.011$	<u>0.00853</u>
		Ni 341 nm, $\leq 0.015$	<u>0.01270</u>
Spectral Resolution: VIS			
		Ba 455 nm, $\leq 0.020$	<u>0.01617</u>



## MAINTENANCE REPORT

### OPTIMA 8000

SERIAL NUMBER 078S1310024C

DATE TESTED September 27, 2024

**Remarks :**

Commissioning follow as commissioning performance sheets.

Calculate MnBEC =  $IB * STD \text{ Conc} / IS - IB$  , where standard conc = 1000 ug/L

IB = Intensity of blank

IS = Intensity of Standard

**Used Mira Mist Nebulizer**

This is to certify that the above tests have been performed and the configuration tested



meets



does not meet

This certificate does not modify PerkinElmer's standard terms and condition of sale, including warranty terms.

**Service Department TH One Source Co., Ltd.**

*Krungchai T.*

( **Krungchai Treevichien** )

**Customer Support Engineer**

```

=====
Align View XY Axial for analyte Mn 257.610
X-position Y-position Intensity
-2.0      15.0      1816338.1
-1.6      15.0      2530610.3
-1.2      15.0      3189278.3
-0.8      15.0      3614260.9
-0.4      15.0      3926066.0
0.0       15.0      3834572.0
0.4       15.0      3678909.6
0.8       15.0      3156679.3
1.2       15.0      2495238.4
1.6       15.0      2541267.5
2.0       15.0      1751387.0
-0.4      10.0       55987.3
-0.4      10.5      85699.0
-0.4      11.0     165498.0
-0.4      11.5     368327.5
-0.4      12.0     678081.3
-0.4      12.5    1199292.7
-0.4      13.0    1786433.0
-0.4      13.5    2906912.3
-0.4      14.0    3839977.9
-0.4      14.5    4759744.0
-0.4      15.0    5401740.9
-0.4      15.5    5841016.4
-0.4      16.0    6008449.1
-0.4      16.5    5567893.2
-0.4      17.0    4510535.5
-0.4      17.5    3802817.9
-0.4      18.0    3001780.4
-0.4      18.5    2146077.0
-0.4      19.0    1316878.0
-0.4      19.5     799272.1
-0.4      20.0     463382.8
-1.2      16.0     4859205.2
-0.8      16.0     5531906.7
-0.4      16.0     5846490.8
0.0       16.0     5683533.7
0.4       16.0     5207908.3
-0.4      14.0     4289105.7
-0.4      14.5     4791674.6
-0.4      15.0     5586702.4
-0.4      15.5     5920442.0
-0.4      16.0     5921171.7
-0.4      16.5     5593601.7
-0.4      17.0     4758747.4
-0.4      17.5     3840338.4
-0.4      18.0     3070470.1
=====

```

```

-----
27/9/2567 10:25:06 aligned for analyte Mn 257.610
X viewing position set to -0.4 mm having Peak intensity 5921171.7 for Axial viewing
Y viewing position set to 16.0 mm having Peak intensity 5921171.7 for Axial viewing
=====

```

```

=====
Align View X Radial for analyte Mn 257.610
X-position Y-position Intensity
-7.0      15.0      49486.2
-6.5      15.0      56575.6
-6.0      15.0      69024.4
-5.5      15.0      83981.4
-5.0      15.0     104895.3
-4.5      15.0     131033.5
-4.0      15.0     163001.2
-3.5      15.0     195402.6
-3.0      15.0     249468.8
-2.5      15.0     342466.5
-2.0      15.0     451795.1
-1.5      15.0     553731.8
-1.0      15.0     667318.0
=====

```



-0.5	15.0	757255.0
0.0	15.0	767649.3
0.5	15.0	735056.1
1.0	15.0	615631.0
1.5	15.0	471489.5
2.0	15.0	333664.2
2.5	15.0	246754.1
3.0	15.0	208559.5
3.5	15.0	163643.5
4.0	15.0	124333.8
4.5	15.0	98031.2
5.0	15.0	75416.8
5.5	15.0	56950.9
6.0	15.0	42516.0
6.5	15.0	32928.9
7.0	15.0	24783.4

-----  
27/9/2567 10:28:26 aligned for analyte Mn 257.610

X viewing position set to 0.0 mm having Peak intensity 767649.3 for Radial viewing

=====

=====  
Analysis Begun

Start Time: 27/9/2567 10:48:28                      Plasma On Time: 27/9/2567 10:17:24  
Logged In Analyst: TET                              Technique: ICP Continuous  
Spectrometer: Optima 8000                          Autosampler: S10

Sample Information File:  
Batch ID:  
Results Data Set: DLRL\_A270924  
Results Library: C:\Users\Public\PerkinElmer\ICP\Data\Results\Results.mdb

=====  
Method Loaded  
Method Name: DLRL-Cal                              Method Last Saved: 27/9/2567 10:48:23  
IEC File:    MSF File:  
Method Description: Calibration for later test

=====  
Sequence No.: 1                                      Autosampler Location:  
Sample ID: Calib Blank 1                              Date Collected: 27/9/2567 10:48:32  
Analyst:    Data Type: Original  
Initial Sample Wt:                                      Initial Sample Vol:  
Dilution:    Sample Prep Vol:  
Wash Time:

-----  
Nebulizer Parameters: Calib Blank 1  
Analyte                      Back Pressure              Flow  
All                              187.0 kPa                      0.55 L/min

-----  
Mean Data: Calib Blank 1  

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Calib Conc. Units
As 193.696	24.2	6.15	25.39%	[0.00] mg/L
Zn 213.857	405.8	9.47	2.33%	[0.00] mg/L
Mn 257.610	454.5	55.73	12.26%	[0.00] mg/L
La 379.478	68.3	4.48	6.55%	[0.00] mg/L
Ba 455.403	12522.9	87.42	0.70%	[0.00] mg/L
Ba 493.408	9724.3	90.69	0.93%	[0.00] mg/L

=====  
Sequence No.: 2                                      Autosampler Location:  
Sample ID: Calib Std 1                              Date Collected: 27/9/2567 10:52:55  
Analyst:    Data Type: Original  
Initial Sample Wt:                                      Initial Sample Vol:  
Dilution:    Sample Prep Vol:  
Wash Time:

-----  
Nebulizer Parameters: Calib Std 1  
Analyte                      Back Pressure              Flow  
All                              186.0 kPa                      0.55 L/min

-----  
Mean Data: Calib Std 1  

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Calib Conc. Units
As 193.696	10332.8	118.28	1.14%	[5.0] mg/L
Zn 213.857	114998.8	1360.71	1.18%	[1.0] mg/L
Mn 257.610	1278603.3	34089.13	2.67%	[1.0] mg/L
La 379.478	276804.5	4517.14	1.63%	[1.0] mg/L
Ba 455.403	698163.6	19112.73	2.74%	[0.1] mg/L
Ba 493.408	525803.8	7197.41	1.37%	[0.1] mg/L

-----  
Calibration Summary  

As 193.696	1	Lin, Calc Int	-0.0	2067	0.00000	1.000000
Zn 213.857	1	Lin, Calc Int	0.0	115000	0.00000	1.000000
Mn 257.610	1	Lin, Calc Int	0.0	1279000	0.00000	1.000000
La 379.478	1	Lin, Calc Int	0.0	276800	0.00000	1.000000

Ba 455.403	1	Lin, Calc Int	0.0	6982000	0.00000	1.000000
Ba 493.408	1	Lin, Calc Int	0.0	5258000	0.00000	1.000000

```
=====
Sequence No.: 3                      Autosampler Location:
Sample ID: 10% HNO3                 Date Collected: 27/9/2567 10:55:58
Analyst:                           Data Type: Original
Initial Sample Wt:                  Initial Sample Vol:
Dilution:                         Sample Prep Vol:
Wash Time:
```

```
-----
Nebulizer Parameters: 10% HNO3
Analyte      Back Pressure  Flow
All          187.0 kPa     0.55 L/min
```

```
-----
Mean Data: 10% HNO3

```

Analyte	Mean Corrected Intensity	Calib. Conc. Units	Std.Dev.	Sample Conc. Units	Std.Dev.	RSD
As 193.696	988.0	0.5 mg/L	0.29	478.1 g/L	294.98	61.70%
Zn 213.857	485.2	0.0 mg/L	0.00	4.2 g/L	4.00	94.81%
Mn 257.610	1240.6	0.0 mg/L	0.00	1.0 g/L	0.34	34.95%
La 379.478	101.6	0.0 mg/L	0.00	0.4 g/L	0.17	46.17%
Ba 455.403	467.6	0.0 mg/L	0.00	0.1 g/L	0.05	75.51%
Ba 493.408	449.7	0.0 mg/L	0.00	0.1 g/L	0.01	8.86%

```
=====
Method Loaded
Method Name: DLRL-Check              Method Last Saved: 25/2/2543 11:12:48
IEC File:                          MSF File:
Method Description: As-60,Zn-2, Mn1.0,La-3,Ba455-0.3,Ba493-0.6
```

```
=====
Sequence No.: 4                      Autosampler Location:
Sample ID: 2% HNO3                 Date Collected: 27/9/2567 10:59:33
Analyst:                           Data Type: Original
Initial Sample Wt:                  Initial Sample Vol:
Dilution:                         Sample Prep Vol:
Wash Time:
```

```
-----
Nebulizer Parameters: 2% HNO3
Analyte      Back Pressure  Flow
All          186.0 kPa     0.55 L/min
```

```
-----
Mean Data: 2% HNO3

```

Analyte	Mean Corrected Intensity	Calib. Conc. Units	Std.Dev.	Sample Conc. Units	Std.Dev.	RSD
As 193.696	-14.2	-0.0 mg/L	0.00	-6.9 g/L	3.05	44.45%
Zn 213.857	-157.8	-0.0 mg/L	0.00	-1.4 g/L	0.11	7.91%
Mn 257.610	-162.2	-0.0 mg/L	0.00	-0.1 g/L	0.03	24.90%
La 379.478	53.6	0.0 mg/L	0.00	0.2 g/L	0.16	83.90%
Ba 455.403	387.1	0.0 mg/L	0.00	0.1 g/L	0.03	48.81%
Ba 493.408	260.0	0.0 mg/L	0.00	0.0 g/L	0.04	75.57%

```
=====
```

=====

Analysis Begun

Start Time: 27/9/2567 11:10:10  
Logged In Analyst: TET  
Spectrometer: Optima 8000

Plasma On Time: 27/9/2567 10:17:24  
Technique: ICP Continuous  
Autosampler: S10

Sample Information File:

Batch ID:  
Results Data Set: DLXL\_A270924  
Results Library: C:\Users\Public\PerkinElmer\ICP\Data\Results\Results.mdb

=====

Method Loaded

Method Name: DLXL-Cal

Method Last Saved: 5/10/2552 13:39:33

IEC File:

MSF File:

Method Description: Calibration for later test

=====

Sequence No.: 1

Autosampler Location:

Sample ID: Calib Blank 1

Date Collected: 27/9/2567 11:10:14

Analyst:

Data Type: Original

Initial Sample Wt:

Initial Sample Vol:

Dilution:

Sample Prep Vol:

Wash Time:

-----

Nebulizer Parameters: Calib Blank 1

Analyte	Back Pressure	Flow
All	188.0 kPa	0.55 L/min

-----

Mean Data: Calib Blank 1

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Units
As 193.696	36.8	3.17	8.62%	[0.00]	g/L
Se 196.026	37.0	0.88	2.37%	[0.00]	g/L
Tl 190.801	-63.7	8.31	13.05%	[0.00]	g/L
Pb 220.353	452.0	5.57	1.23%	[0.00]	g/L

=====

Sequence No.: 2

Autosampler Location:

Sample ID: DL-Standard

Date Collected: 27/9/2567 11:12:44

Analyst:

Data Type: Original

Initial Sample Wt:

Initial Sample Vol:

Dilution:

Sample Prep Vol:

Wash Time:

-----

Nebulizer Parameters: DL-Standard

Analyte	Back Pressure	Flow
All	187.0 kPa	0.55 L/min

-----

Mean Data: DL-Standard

Analyte	Mean Corrected Intensity	Std.Dev.	RSD	Conc.	Units
As 193.696	8456.7	552.97	6.54%	[1000]	g/L
Se 196.026	746.3	33.45	4.48%	[500]	g/L
Tl 190.801	10699.7	205.35	1.92%	[1000]	g/L
Pb 220.353	23233.1	423.05	1.82%	[500]	g/L

-----

Calibration Summary

As 193.696	1	Lin, Calc Int	0.0	8.457	0.00000	1.000000
Se 196.026	1	Lin, Calc Int	0.0	1.493	0.00000	1.000000
Tl 190.801	1	Lin, Calc Int	0.0	10.70	0.00000	1.000000
Pb 220.353	1	Lin, Calc Int	-0.0	46.47	0.00000	1.000000

=====

Sequence No.: 3

Autosampler Location:

Sample ID: 10%HN03

Date Collected: 27/9/2567 11:15:41

Analyst: Data Type: Original  
Initial Sample Wt: Initial Sample Vol:  
Dilution: Sample Prep Vol:  
Wash Time:

-----  
Nebulizer Parameters: 10%HNO3

Analyte Back Pressure Flow  
All 186.0 kPa 0.55 L/min

-----  
Mean Data: 10%HNO3

Analyte	Mean Corrected Intensity	Calib. Conc. Units	Std.Dev.	Sample Conc. Units	Std.Dev.	RSD
As 193.696	91.2	10 g/L	3.00	10 g/L	3.00	27.84%
Se 196.026	41.2	30 g/L	9.83	30 g/L	9.83	35.57%
Tl 190.801	6.5	1 g/L	1.08	1 g/L	1.08	178.82%
Pb 220.353	29.3	1 g/L	0.27	1 g/L	0.27	43.60%

=====  
Method Loaded

Method Name: DLXL-Check Method Last Saved: 25/2/2543 10:51:16  
IEC File: MSF File:  
Method Description: Sample Std.Dev As/Tl <=10 g/l ,Se<=-5 g/l ,Pb<=3 g/l

=====  
Sequence No.: 4

Sample ID: 2%HNO3 Autosampler Location:  
Date Collected: 27/9/2567 11:18:19  
Analyst: Data Type: Original  
Initial Sample Wt: Initial Sample Vol:  
Dilution: Sample Prep Vol:  
Wash Time:

-----  
Nebulizer Parameters: 2%HNO3

Analyte Back Pressure Flow  
All 188.0 kPa 0.55 L/min

-----  
Mean Data: 2%HNO3

Analyte	Mean Corrected Intensity	Calib. Conc. Units	Std.Dev.	Sample Conc. Units	Std.Dev.	RSD
As 193.696	23.1				8.89	38.48%
Se 196.026	54.0				5.00	13.59%
Tl 190.801	-58.5				8.49	14.53%
Pb 220.353	434.8				0.17	4.18%

=====  
Method Loaded  
Method Name: Precision  
IEC File:  
Method Description: N=10- 1.0% RSD  
Method Last Saved: 22/4/2554 10:20:08  
MSF File:

=====  
Sequence No.: 3  
Sample ID: Precision  
Analyst:  
Initial Sample Wt:  
Dilution:  
Wash Time:  
Autosampler Location:  
Date Collected: 27/9/2567 10:36:22  
Data Type: Original  
Initial Sample Vol:  
Sample Prep Vol:

-----  
Nebulizer Parameters: Precision  
Analyte Back Pressure Flow  
All 188.0 kPa 0.55 L/min

-----  
Mean Data: Precision  

Analyte	Mean Corrected Intensity	Calib. Conc. Units	Std.Dev.	Sample Conc. Units	Std.Dev.	RSD
Zn 206.200	242436.8				1928.28	0.80%
Mg 280.271	2192985.1				14305.05	0.65%
Mg 285.213	122825.5				1173.82	0.96%
Ba 455.403	5765331.2				22705.37	0.39%

=====

ภาคผนวก ฉ

---

หนังสือขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
เลขทะเบียน ว-236



ที่ อก ๐๓๐๑(๑)/ ๕ ๕ ๗ ๒

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

## ๒ ๒ มีคุณายน ๒๕๖๖

เรื่อง ต่ออายุหนังสือรับทะเบียนเพื่อขอปฏิบัติกรวิเคราะห้เอกชน  
เรียน กรรมการผู้จัดการ บริษัท เทคโนโลยีสิ่งแวดลอมไทย จำกัด  
อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๓ มีนาคม ๒๕๖๖

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
บริษัท เทคโนโลยีสิ่งแวดลอมไทย จำกัด จำนวน ๒๘ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เทคโนโลยีสิ่งแวดลอมไทย จำกัด ขอต่ออายุหนังสือรับขึ้นทะเบียน  
ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๒๓๖-๑-๐๐๓๓ สถานที่ตั้งเลขที่ ๑/๖ ซอยรามคำแหง ๑๕๕ แขวงสะพานสูง  
เขตสะพานสูง กรุงเทพมหานคร ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เทคโนโลยีสิ่งแวดลอมไทย จำกัด ต่ออายุหนังสือรับขึ้น  
ทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์

- ๑) นายณัฐพงศ์ โคตะมา ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๑
- ๒) นางสาววรรัตน์ ประชุมแดง ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๒
- ๓) นางสาววรรัตน์ เพชรชัย ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๓
- ๔) นายสมชาย ปิยะวรสกุล ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๔
- ๕) นายประมวล มูลสาร ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๕
- ๖) นายรัฐพล สุขดี ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๖

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

- ๑) นางสาวทองผา อัครวิสุภิกรม ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๑
- ๒) นางสาวกมลลักษ์ณ์ สิมงคล ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๒
- ๓) นางสาวกนกวรรณ เริ่มประชาธิปไตย ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๓
- ๔) นางสาวฐิติพรรณ ศรีสุวรรณ ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๔
- ๕) นางสาวอนิศา ภูมิพิชาติ ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๕
- ๖) นางสาวมาลี นิรัตน์ ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๖
- ๗) นางสาวพัชราพรณ สว่างพ ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๗
- ๘) นายสุริยะพงศ์ อยุทธ ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๘
- ๙) นางสาวดอกรัก สีนเหล็ก ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๐๙
- ๑๐) นางสาวศิริพร กาจิต ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๑๐
- ๑๑) นายสุชาติ ศรีบุญ ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๑๑
- ๑๒) นายเกียรติศักดิ์ วันดี ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๑๒

๑๓) นายจิรวัฒน์...

- ๒ -

- ๑๓) นายจิรวัฒน์ อินทะเสย์ ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๑๓
- ๑๔) นางสาวนิตยา เ็นวัฒนา ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๑๔
- ๑๕) นางสาวณัฐญา สารแสง ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๑๕
- ๑๖) นายกิตติศักดิ์ เมืองงาม ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๑๖
- ๑๗) นายทวงค์ เพียรภาทะ ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๑๗
- ๑๘) นายเฉลิมวุฒิ พูลสงวน ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๑๘
- ๑๙) นางสาวนุศิรี อรพร ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๑๙
- ๒๐) นางสาววรรณศิริ สุริวงค์ ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๒๐
- ๒๑) นายวิฑูณ วลัยรัตน์ ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๒๑
- ๒๒) นางสาวกมลธิดา จอกสูงเนิน ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๒๒
- ๒๓) นางสาวสุวิทย์ญา อยู่ปิ่น ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๒๓
- ๒๔) นางสาวลลิตา ตริยโณม ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๒๔
- ๒๕) นายเจอ แซ่หว้า ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๒๕
- ๒๖) นายอรรถพล วงศ์สวัสดิ์ ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๒๖
- ๒๗) นายประยัต จินดา ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๒๗
- ๒๘) นายเนญจพล กรังคคา ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๒๘
- ๒๙) นายวีรพล บุตรา ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๒๙
- ๓๐) นายพิเชฐ อยู่รัมย์ ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๓๐
- ๓๑) นายณัฐณัย ศรีรัตนพิชาลัย ทะเบียนเลขที่ ๖-๒๓๖-๑-๐๐๓๑

ค. ขอข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย นำได้คืน อากาศเสีย สิ่งปฏิกูลหรือ  
วัสดุที่ไม่ใช้แล้ว และดิน ตามสิ่งที่ส่งมาด้วย

หนังสือฉบับนี้จะหมดอายุในวันที่ ๑๓ มีนาคม ๒๕๖๙ หากประสงค์ต่ออายุหนังสือ  
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อ  
กรมโรงงานอุตสาหกรรม ภายใน ๓๐ วัน ก่อนวันสิ้นสุดของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
ดังนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ  
๗๖ ๑๖

✓ (นายประสม ศำรงพงษ์)  
ผู้อำนวยการวิจัยและพัฒนายลสิ่งแวดลอม  
ผู้บริหารงานแผนอัตรากำลังคนอุตสาหกรรม

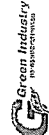
กองวิจัยและพัฒนายลสิ่งแวดลอม

กลุ่มมาตรฐานวิชาการวิเคราะห์ทดสอบแลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๕๓๐ ๖๓๑๒ ต่อ ๒๑๙๕

ไปรษณีย์อิเล็กทรอนิกส์ saraban@dlw.mail.go.th



"อุตสาหกรรมก้าวไกล ประเทศไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"





เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
บริษัท เพคนิคสิ่งแวดล้อมไทย จำกัด  
ที่ อก ๐๓๑๐(๑)/ ๙ ๘ ๗ ๖  
ลงวันที่ ๒๒ มิถุนายน ๒๕๖๖  
ขอช่วยสารเคมีฯที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๓๗ รายการ  
น้ำเสีย จำนวน 40 รายการ

ลำดับที่	สารเคมีฯ	วิธีวิเคราะห์
1	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
2	Arsenic	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(a)</sup>
3	Barium	1) Digestion, Direct Nitrous Oxide-Acetylene Flame Method <sup>(a)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(a)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
4	α-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
5	γ-BHC	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
6	Biochemical Oxygen Demand	5-Day BOD Test, Azide Modification Method <sup>(a)</sup>
7	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method <sup>(a)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(a)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
8	Chemical Oxygen Demand	Closed Reflux, Titrimetric Method <sup>(a)</sup>
9	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
10	Chromium	1) Digestion, Direct Air-Acetylene Flame Method <sup>(a)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(a)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
11	Color	ADMI Weighted-Ordinate Spectrophotometric Method <sup>(a)</sup>
12	Copper	1) Digestion, Direct Air-Acetylene Flame Method <sup>(a)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(a)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
13	Cyanide	Distillation, Colorimetric Method <sup>(a)</sup>
14	4,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
15	4,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
16	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>

17 Endosulfan I...

ลำดับที่	สารเคมีฯ	วิธีวิเคราะห์
17	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
18	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
19	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
20	Endrin	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
21	Formaldehyde	Distillation, Colorimetric Method <sup>(a)</sup>
22	Free Chlorine	DPD Ferrous Titrimetric Method <sup>(a)</sup>
23	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
24	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
25	Hexavalent Chromium	Colorimetric Method <sup>(a)</sup>
26	Lead	1) Digestion, Direct Air-Acetylene Flame Method <sup>(a)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(a)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
27	Manganese	1) Digestion, Direct Air-Acetylene Flame Method <sup>(a)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(a)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
28	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(a)</sup>
29	Nickel	1) Digestion, Direct Air-Acetylene Flame Method <sup>(a)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(a)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
30	Oil & Grease	1) Liquid-Liquid, Partition-Gravimetric Method <sup>(a)</sup> 2) Soxhlet Extraction Method <sup>(a)</sup>
31	pH	Electrometric Method <sup>(a)</sup>
32	Phenols	Distillation, Direct Photometric Method <sup>(a)</sup>
33	Selenium	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(a)</sup>
34	Sulfide	1) Iodometric Method <sup>(a)</sup> 2) Methylene Blue Method <sup>(a)</sup>
35	Temperature	Laboratory and Field Methods <sup>(a)</sup>
36	Total Dissolved Solids	Dried at 180 °C <sup>(a)</sup>
37	Total Kjeldahl Nitrogen	Macro-Kjeldahl Method <sup>(a)</sup>
38	Total Suspended Solids	Dried at 103-105 °C <sup>(a)</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
39	Trivalent Chromium	Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation <sup>(a)</sup>
40	Zinc	1) Digestion, Direct Air-Acetylene Flame Method <sup>(a)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(a)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>

น้ำดื่ม จำนวน 122 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
2	Acetone	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
3	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
4	Anthrane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
5	Antimony	1) Digestion, Direct Air-Acetylene Flame Method <sup>(a)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(a)</sup>
6	Arsenic	3) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup> Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(a)</sup>
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
8	Barium	1) Digestion, Direct Nitrous Oxide-Acetylene Flame Method <sup>(a)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(a)</sup>
9	Benz(a)anthracene	3) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup> Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
10	Benzene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
11	Benzo(b)fluoranthene	Mass Spectrometric Method <sup>(a)</sup> Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
12	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>

13 Benzoic acid...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
13	Benzoic acid	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
14	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
15	Benzo(g,h,i)perylene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
16	Beryllium	1) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(a)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
17	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
19	Bromodichloromethane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
20	Bromoform	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
21	Butanol	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
22	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
23	Cadmium	1) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(a)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
25	Carbon disulfide	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
26	Carbon tetrachloride	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
27	Chlordane	Mass Spectrometric Method <sup>(a)</sup> Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
29	Chlorobenzene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
30	Chlorodibromomethane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
31	Chloroform	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>

32 Chromium...

ลำดับที่	สารเคมี	วิธีการตรวจ
32	Chromium	1) Digestion, Direct Air-Acetylene Flame Method <sup>(a)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(a)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup> 1) Digestion, Direct Air-Acetylene Flame Method; Colorimetric Method; Calculation <sup>(a)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method; Colorimetric Method; Calculation <sup>(a)</sup> 3) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation <sup>(a)</sup> Colorimetric Method <sup>(a)</sup>
33	Chromium (III)	
34	Chromium (VI)	
35	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
36	Cyanide	Distillation, Colorimetric Method <sup>(a)</sup>
37	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
38	DDD	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
39	DDE	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
40	DDT	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
41	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
42	Di-n-butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
43	1,2-Dichlorobenzene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
44	1,3-Dichlorobenzene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
45	1,4-Dichlorobenzene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
46	1,1-Dichloroethane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
47	1,2-Dichloroethane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
48	1,1-Dichloroethylene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
49	cis-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>

ลำดับที่	สารเคมี	วิธีการตรวจ
50	trans-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
51	1,2-Dichloropropane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
52	1,3-Dichloropropane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
53	1,3-Dichloropropene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
54	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
55	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
56	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
57	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
58	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
59	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
60	Di-n-Octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
61	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
62	Endrin	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
63	Ethylbenzene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
64	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
65	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
66	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
67	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
68	Hexachloro-1,3-butadiene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
69	n-Hexane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
70	α-HCH	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
71	β-HCH	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
72	γ-HCH	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
73	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>

ลำดับที่	สารเคมี	วิธีวิเคราะห์
74	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
75	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
76	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
77	Lead	1) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(a)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
78	Manganese	1) Digestion, Direct Air-Acetylene Flame Method <sup>(a)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(a)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
79	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(a)</sup>
80	Methanol	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
81	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
82	Methyl bromide	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
83	Methylene chloride	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
84	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
85	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
86	Methyl tert-butyl ether	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
87	Naphthalene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
88	Nickel	1) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(a)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
89	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
90	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>

ลำดับที่	สารเคมี	วิธีวิเคราะห์
91	N-Nitrosodi-n-propylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
92	Polychlorinated Biphenyls PCB-1016 PCB-1221 PCB-1232 PCB-1242 PCB-1248 PCB-1254 PCB-1260	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
93	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
94	pH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
95	Phenanthrene	1) Distillation, Direct Photometric Method <sup>(a)</sup> 2) Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
96	Phenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
97	Pyrene	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(a)</sup>
98	Selenium	1) Digestion, Direct Air-Acetylene Flame Method <sup>(a)</sup> 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(a)</sup>
99	Silver	3) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
100	Styrene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
101	1,1,2,2-Tetrachloroethane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
102	Tetrachloroethylene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
103	Toluene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
104	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
105	TPH (C <sub>5</sub> -C <sub>6</sub> )	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(a)(222)</sup>

ลำดับที่	สารเคมี	วิธีวิเคราะห์
106	TPH (C <sub>8</sub> -C <sub>16</sub> )	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(b)(2)</sup>
107	TPH (C <sub>5</sub> -C <sub>35</sub> )	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(b)(2)</sup>
108	1,2,4-Trichlorobenzene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
109	1,1,1-Trichloroethane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
110	1,1,2-Trichloroethane	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
111	Trichloroethylene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
112	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
113	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(a)</sup>
114	1,3,5-Trimethylbenzene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
115	Vanadium	1) Digestion, Electrothermal Atomic Absorption Spectrometric Method <sup>(a)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>
116	Vinyl acetate	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
117	Vinyl chloride	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
118	m-Xylene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
119	o-Xylene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
120	p-Xylene	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
121	Xylene (Total)	Purge and Trap Gas Chromatographic/ Mass Spectrometric Method <sup>(a)</sup>
122	Zinc	1) Digestion, Direct Air-Acetylene Flame Method <sup>(a)</sup> 2) Digestion, Inductively Coupled Plasma Method <sup>(a)</sup>

อากาศเสีย...

อากาศเสีย (ปล่องระบาย) จำนวน 18 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Antimony	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(a)</sup> 2) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>(a)</sup> 3) Isokinetic Sampling, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(a)</sup> Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(a)</sup> Instrumental Analyzer Method <sup>(a)</sup> Absorption Sampling, Ion Chromatographic Method <sup>(a)</sup>
2	Arsenic	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(a)</sup> 2) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>(a)</sup>
3	Carbon monoxide	Adsorption Sampling, Gas Chromatographic Method <sup>(a)</sup>
4	Chlorine	Isokinetic Sampling, Analysis by ISO/IEC 17025 Accredited Laboratory or Analysis by Department of Industrial Works Registered Laboratory (Dioxins/Furans Analysis Approved) <sup>(a)</sup>
5	Copper	Absorption Sampling, Ion Chromatographic Method <sup>(a)</sup> Absorption Sampling, Ion Chromatographic Method <sup>(a)</sup> Absorption Sampling, Iodometric Method <sup>(a)</sup> 1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(a)</sup> 2) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>(a)</sup>
6	Cresol	Isokinetic Sampling, Gas Chromatographic Method <sup>(a)</sup>
7	Dioxins/Furans	Isokinetic Sampling, Analysis by ISO/IEC 17025 Accredited Laboratory or Analysis by Department of Industrial Works Registered Laboratory (Dioxins/Furans Analysis Approved) <sup>(a)</sup>
8	Hydrogen Chloride	Absorption Sampling, Ion Chromatographic Method <sup>(a)</sup>
9	Hydrogen Fluoride	Absorption Sampling, Ion Chromatographic Method <sup>(a)</sup>
10	Hydrogen Sulfide	Absorption Sampling, Iodometric Method <sup>(a)</sup>
11	Lead	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>(a)</sup> 2) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method <sup>(a)</sup> 3) Isokinetic Sampling, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(a)</sup> Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(a)</sup> Ringelmann's Method <sup>(a)</sup>
12	Mercury	1) Absorption Sampling, Phenoldisulfonic acid Method <sup>(a)</sup> 2) Instrumental Analyzer Method <sup>(a)</sup>
13	Opacity	
14	Oxides of Nitrogen	

15 Sulfur dioxide...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
15	Sulfur dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method <sup>[5]</sup> 2) Instrumental Analyzer Method <sup>[5]</sup>
16	Sulfuric acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method <sup>[5]</sup>
17	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method <sup>[5]</sup>
18	Xylene	Adsorption Sampling, Gas Chromatographic Method <sup>[5]</sup>

สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 36 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method <sup>[1,10,24]</sup> 2) Solid-Phase Extraction, Gas Chromatographic Method <sup>[10,24]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[11,24]</sup>
2	Antimony	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>[1,6,13]</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>[1,6,16]</sup> 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup>
3	Arsenic	4) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,19]</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>[7,16]</sup> 6) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup> 1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[1,6,17]</sup> 2) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>[7,17]</sup>
4	Barium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>[1,6,13]</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>[1,6,16]</sup> 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup>

4) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
5	Beryllium	4) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,19]</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>[7,16]</sup> 6) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup> 1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>[1,6,13]</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>[1,6,16]</sup> 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 4) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,19]</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>[7,16]</sup> 6) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
6	Cadmium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>[1,6,13]</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>[1,6,16]</sup> 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,14]</sup> 4) Digestion, Flame Atomic Absorption Spectrometric Method <sup>[7,19]</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>[7,16]</sup> 6) Digestion, Inductively Coupled Plasma Method <sup>[7,14]</sup>
7	Chlordane	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method <sup>[1,10,24]</sup> 2) Solid-Phase Extraction, Gas Chromatographic Method <sup>[10,24]</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>[11,24]</sup>
8	Chromium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>[1,6,13]</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>[1,6,16]</sup>

3) Waste Extraction...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
9	Chromium (III)	3) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1.6.14)</sup> 4) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.15)</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.16)</sup> 6) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup> 1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation <sup>(1.6.15.18)</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation <sup>(1.6.15.18)</sup> 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation <sup>(1.6.15.18)</sup> 4) Digestion, Flame Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation <sup>(7.8.15.18)</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation <sup>(7.8.15.18)</sup> 6) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation <sup>(7.8.15.18)</sup>
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method <sup>(1.18)</sup> 2) Alkaline Digestion, Colorimetric Method <sup>(8.18)</sup>
11	Cobalt	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1.6.15)</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(1.6.16)</sup> 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1.6.14)</sup> 4) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.15)</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.16)</sup> 6) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>

ลำดับที่	สารเคมี	วิธีวิเคราะห์
12	Copper	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1.6.13)</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(1.6.16)</sup> 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1.6.14)</sup> 4) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.15)</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.16)</sup> 6) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup> 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1.9.24)</sup> 2) Soxhlet Extraction, Gas Chromatographic Method <sup>(1.1.24)</sup> 1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 2) Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>(1.1.24)</sup> 1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 2) Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>(1.1.24)</sup>
13	2,4-D	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 2) Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>(1.1.24)</sup>
14	DDO	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 2) Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>(1.1.24)</sup>
15	DDE	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 2) Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>(1.1.24)</sup>
16	DDT	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 2) Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>(1.1.24)</sup>
17	Dieldrin	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 2) Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>(1.1.24)</sup>

ลำดับที่	สารเคมี	วิธีวิเคราะห์
18	Endrin	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 2) Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>(1.1.24)</sup>
19	Heptachlor	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 2) Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>(1.1.24)</sup>
20	Lead	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1.6.13)</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(1.6.16)</sup> 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1.6.14)</sup> 4) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.13)</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.16)</sup> 6) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>
21	Lindane	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 2) Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>(1.1.24)</sup> 4) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(1.6.19)</sup> 5) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(20)</sup> 6) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup>
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(1.6.19)</sup> 2) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(20)</sup>
23	Methoxychlor	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup> 2) Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.24)</sup>

3) Soxhlet...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
24	Mirex	3) Soxhlet Extraction, Gas Chromatographic Method <sup>(1.1.24)</sup> 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1.9.24)</sup> 2) Soxhlet Extraction, Gas Chromatographic Method <sup>(1.1.24)</sup>
25	Molybdenum	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1.6.13)</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(1.6.16)</sup> 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1.6.14)</sup> 4) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.13)</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.16)</sup> 6) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>
26	Nickel	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1.6.13)</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(1.6.16)</sup> 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1.6.14)</sup> 4) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.13)</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.16)</sup> 6) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>
27	Polychlorinated Biphenyls Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260 2,4,4'-Trichlorobiphenyl 2,2',5,5'-Tetrachlorobiphenyl	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1.9.23)</sup> 2) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10.23)</sup> 3) Soxhlet Extraction, Gas Chromatographic Method <sup>(1.1.23)</sup>

2,2',4,5,5'...



ลำดับที่	สารเคมี	วิธีวิเคราะห์
28	2,2',4,5,5'-Pentachlorobiphenyl 2,2',3,4,4',5'-Hexachlorobiphenyl 2,2',4,4',5,5'-Hexachlorobiphenyl 2,2',3,4,4',5,5'-Heptachlorobiphenyl Pentachlorophenol	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>(1.9,24)</sup> 2) Soxhlet Extraction, Gas Chromatographic Method <sup>(1.124)</sup> 1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(1.6,21)</sup> 2) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(7.21)</sup> 1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1.6,19)</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(1.6,18)</sup> 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1.6,14)</sup> 4) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.19)</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.18)</sup> 6) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>
29	Selenium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1.6,19)</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(1.6,18)</sup> 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1.6,14)</sup> 4) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.19)</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.18)</sup> 6) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>
30	Silver	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1.6,19)</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(1.6,18)</sup> 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1.6,14)</sup> 4) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.19)</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.18)</sup> 6) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>
31	Thallium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1.6,19)</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(1.6,18)</sup> 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1.6,14)</sup> 4) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.19)</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.18)</sup> 6) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>

ลำดับที่	สารเคมี	วิธีวิเคราะห์
32	Toxaphene	1) Waste Extraction, Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10,24)</sup> 2) Solid-Phase Extraction, Gas Chromatographic Method <sup>(1.10,24)</sup> 3) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>(1.12,7)</sup> 1) Waste Extraction, Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1.12,26)</sup> 2) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1.12,26)</sup> 1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1.6,19)</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(1.6,18)</sup> 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1.6,14)</sup> 4) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.19)</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.18)</sup> 6) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>
33	Trichloroethylene	1) Waste Extraction, Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1.12,26)</sup> 2) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1.12,26)</sup> 1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1.6,19)</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(1.6,18)</sup> 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1.6,14)</sup> 4) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.19)</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.18)</sup> 6) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>
34	Vanadium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1.6,19)</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(1.6,18)</sup> 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1.6,14)</sup> 4) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.19)</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.18)</sup> 6) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>
35	Vinyl chloride	1) Waste Extraction, Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1.12,26)</sup> 2) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>(1.12,26)</sup> 1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1.6,19)</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(1.6,18)</sup> 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1.6,14)</sup> 4) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.19)</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.18)</sup> 6) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>
36	Zinc	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method <sup>(1.6,19)</sup> 2) Waste Extraction, Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(1.6,18)</sup> 3) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>(1.6,14)</sup> 4) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.19)</sup> 5) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.18)</sup> 6) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>

ดิน จำนวน 121 รายการ

ลำดับที่	สารเคมี	วิธีวิเคราะห์
1	Acenaphthene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11.27)</sup>
2	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
3	Aldrin	Soxhlet Extraction, Gas Chromatographic Method <sup>(11.24)</sup>
4	Anthracene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11.27)</sup>
5	Antimony	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.15)</sup> 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.16)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>
6	Arsenic	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(7.17)</sup>
7	Atrazine	Soxhlet Extraction, Gas Chromatographic Method <sup>(11.24)</sup>
8	Barium	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.15)</sup> 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.16)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>
9	Benz(a)anthracene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11.27)</sup>
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
11	Benzo(b)fluoranthene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11.27)</sup>
12	Benzo(k)fluoranthene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11.27)</sup>
13	Benzoic acid	Soxhlet Extraction, Gas Chromatographic Method <sup>(11.23)</sup>
14	Benzo(a)pyrene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11.27)</sup>
15	Benzo(g,h,i)perylene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11.27)</sup>
16	Beryllium	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.15)</sup>

2) Digestion...

วิธีวิเคราะห์

ลำดับที่	สารเคมี	วิธีวิเคราะห์
17	Bis(2-chloroethyl)ether	2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.16)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>
18	Bis(2-ethylhexyl)phthalate	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11.27)</sup>
19	Bromodichloromethane	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11.27)</sup>
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
21	Butanol	Mass Spectrometric Method <sup>(13.26)</sup>
22	Butyl benzyl phthalate	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
23	Cadmium	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11.27)</sup> 1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.15)</sup> 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.16)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup>
24	Carbazole	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11.27)</sup>
25	Carbon disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
27	Chlordane	Soxhlet Extraction, Gas Chromatographic Method <sup>(11.24)</sup>
28	p-Chloroaniline	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11.27)</sup>
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
32	Chromium	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7.15)</sup>

2) Digestion...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
33	Chromium (III)	2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7.16)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7.14)</sup> 1) Digestion, Flame Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation <sup>(7.8,15,18)</sup> 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation <sup>(7.8,16,18)</sup> 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation <sup>(7.8,14,18)</sup>
34	Chromium (VI)	Alkaline Digestion, Colorimetric Method <sup>(8.18)</sup>
35	Chrysene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11.27)</sup>
36	Cyanide	1) Extraction, Distillation, Titrimetric Method <sup>(28.29,30)</sup> 2) Extraction, Distillation, Colorimetric Method <sup>(28.29,30)</sup>
37	2,4-D	Soxhlet Extraction, Gas Chromatographic Method <sup>(11.24)</sup>
38	DDD	Soxhlet Extraction, Gas Chromatographic Method <sup>(11.24)</sup>
39	DDE	Soxhlet Extraction, Gas Chromatographic Method <sup>(11.24)</sup>
40	DDT	Soxhlet Extraction, Gas Chromatographic Method <sup>(11.24)</sup>
41	Dibenz(a,h)anthracene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11.27)</sup>
42	Di-n-butyl phthalate	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11.27)</sup>
43	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
44	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
45	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
46	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
47	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
48	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>

49 cis-1,2-Dichloroethylene...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
49	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
50	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
51	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
52	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
53	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
54	Dieldrin	Mass Spectrometric Method <sup>(11.24)</sup>
55	Diethyl phthalate	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11.27)</sup>
56	2,4-Dimethylphenol	Soxhlet Extraction, Gas Chromatographic Method <sup>(11.23)</sup>
57	2,4-Dinitrophenol	Soxhlet Extraction, Gas Chromatographic Method <sup>(11.23)</sup>
58	2,4-Dinitrotoluene	Soxhlet Extraction, Gas Chromatographic Method <sup>(11.23)</sup>
59	2,6-Dinitrotoluene	Soxhlet Extraction, Gas Chromatographic Method <sup>(11.23)</sup>
60	Di-n-Octyl phthalate	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11.27)</sup>
61	Endosulfan	Soxhlet Extraction, Gas Chromatographic Method <sup>(11.24)</sup>
62	Endrin	Soxhlet Extraction, Gas Chromatographic Method <sup>(11.24)</sup>
63	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
64	Fluoranthene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11.27)</sup>
65	Fluorene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11.27)</sup>
66	Heptachlor	Soxhlet Extraction, Gas Chromatographic Method <sup>(11.24)</sup>
67	Heptachlor epoxide	Soxhlet Extraction, Gas Chromatographic Method <sup>(11.24)</sup>
68	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
69	n-Hexane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13.26)</sup>
70	α-HCH	Soxhlet Extraction, Gas Chromatographic Method <sup>(11.24)</sup>
71	β-HCH	Soxhlet Extraction, Gas Chromatographic Method <sup>(11.24)</sup>
72	γ-HCH	Soxhlet Extraction, Gas Chromatographic Method <sup>(11.24)</sup>

73 Hexachlorocyclopentadiene...

ลำดับที่	สารเคมี	วิธีวิเคราะห์
73	Hexachlorocyclopentadiene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,27)</sup>
74	Hexachloroethane	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,27)</sup>
75	Indeno(1,2,3-cd)pyrene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,27)</sup>
76	Isophorone	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,27)</sup>
77	Lead	Mass Spectrometric Method <sup>(11,27)</sup> 1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,15)</sup> 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7,16)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
78	Manganese	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,15)</sup> 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7,16)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
79	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>(20)</sup>
80	Methanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
81	Methoxychlor	Soxhlet Extraction, Gas Chromatographic Method <sup>(11,24)</sup>
82	Methyl bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
83	Methylene chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
84	2-Methylphenol	Soxhlet Extraction, Gas Chromatographic Method <sup>(11,23)</sup>
85	2-Methylnaphthalene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,27)</sup>
86	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
87	Naphthalene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
88	Nickel	Mass Spectrometric Method <sup>(13,26)</sup> 1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,15)</sup> 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7,16)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>

ลำดับที่	สารเคมี	วิธีวิเคราะห์
89	Nitrobenzene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,27)</sup>
90	N-Nitrosodiphenylamine	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,27)</sup>
91	N-Nitrosodi-n-propylamine	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,27)</sup>
92	Polychlorinated Biphenyls Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260 2,2',5,5'-Tetrachlorobiphenyl 2,2',4,5,5'-Pentachlorobiphenyl 2,2',3,4,4',5'- Hexachlorobiphenyl 2,2',4,4',5,5'- Hexachlorobiphenyl 2,2',3,4,4',5,5'- Heptachlorobiphenyl Pentachlorophenol Phenanthrene	Soxhlet Extraction, Gas Chromatographic Method <sup>(11,23)</sup> Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,27)</sup> Soxhlet Extraction, Gas Chromatographic Method <sup>(11,23)</sup> Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,27)</sup> Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(7,21)</sup> 1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,15)</sup> 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7,16)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup> Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
93	Phenol	Soxhlet Extraction, Gas Chromatographic Method <sup>(11,23)</sup>
94	Pyrene	Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>(11,27)</sup>
95	Selenium	Digestion, Hydride Generation/Atomic Absorption Spectrometric Method <sup>(7,21)</sup>
96	Silver	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,15)</sup> 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7,16)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
97	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>

ลำดับที่	สารเคมี	วิธีวิเคราะห์
100	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
101	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
102	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
103	Toxaphene	Soxhlet Extraction, Gas Chromatographic Method <sup>(11,24)</sup>
104	TPH (C <sub>5</sub> -C <sub>9</sub> )	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
105	TPH (C <sub>10</sub> -C <sub>16</sub> )	Soxhlet Extraction, Gas Chromatographic Method <sup>(11,22)</sup>
106	TPH (C <sub>15</sub> -C <sub>25</sub> )	Soxhlet Extraction, Gas Chromatographic Method <sup>(11,22)</sup>
107	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
108	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
109	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
110	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
111	2,4,5-Trichlorophenol	Soxhlet Extraction, Gas Chromatographic Method <sup>(11,23)</sup>
112	2,4,6-Trichlorophenol	Soxhlet Extraction, Gas Chromatographic Method <sup>(11,23)</sup>
113	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
114	Vanadium	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,15)</sup> 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7,16)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>
115	Vinyl acetate	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
116	Vinyl chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
117	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
118	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
119	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>

120 Xylene (Total)

*SM*

ลำดับที่	สารเคมี	วิธีวิเคราะห์
120	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>(13,26)</sup>
121	Zinc	1) Digestion, Flame Atomic Absorption Spectrometric Method <sup>(7,15)</sup> 2) Digestion, Graphite Furnace Atomic Absorption Spectrometric Method <sup>(7,16)</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>(7,14)</sup>

**เอกสารอ้างอิง**

- กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2548. เรื่อง การกำจัดสิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว. ราชกิจจานุเบกษา. 25 มกราคม 2549. เล่มที่ 123 ตอนพิเศษ 113.
- กระทรวงอุตสาหกรรม. ประกาศกระทรวงอุตสาหกรรม, พ.ศ. 2549. เรื่อง กำหนดค่าปริมาณขั้นต่ำที่ถือเป็นในอากาศที่ระเหยออกจากถังของหม้อไอน้ำโรงสีข้าวที่ใช้กลั่นเป็นเชื้อเพลิง. ราชกิจจานุเบกษา. 4 ธันวาคม 2549. เล่มที่ 123 ตอนพิเศษ 125.
- สมาคมวิศวกรรมสิ่งแวดล้อมแห่งประเทศไทย. คู่มือวิเคราะห์น้ำเสีย. พิมพ์ครั้งที่ 4. กรุงเทพฯ: เรือนแก้วการพิมพ์, 2547.
- APHA, AWWA, WEF. Standard Methods for the Examination of Water and Wastewater. 23<sup>rd</sup> ed. Washington, DC: APHA, 2017.
- United States Environmental Protection Agency. Standards of Performance for New Stationary Sources. 40 CFR 60. Appendix A, 2022.
- United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. SW-846, 1997.
- United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Acid Digestion of Sludges and Sediments and Soils. SW-846 Method 3050B, 1996.
- United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Alkaline Digestion for Hexavalent Chromium. SW-846 Method 3060A, 1996.
- United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Separatory Funnel Liquid-Liquid Extraction. SW-846 Method 3510C, 1996.
- United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Solid Phase Extraction. SW-846 Method 3535A, 2007.
- United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Soxhlet Extraction. SW-846 Method 3540C, 1996. *SM*
- United States...

12. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Purge-and-Trap for Aqueous Samples. SW-846 Method 5030C, 2003.
13. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples. SW-846 Method 5035A, 2007.
14. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Inductively Coupled Plasma-Optical Emission Spectrometry. SW-846 Method 6010D, 2018.
15. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Flame Atomic Absorption Spectrophotometry. SW-846 Method 7000B, 2007.
16. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Graphite Furnace Atomic Absorption Spectrophotometry. SW-846 Method 7010, 2007.
17. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Arsenic (Atomic Absorption, Gaseous Hydride). SW-846 Method 7061A, 1992.
18. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Chromium, Hexavalent (Colorimetric). SW-846 Method 7196A, 1992.
19. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Mercury in Liquid Waste (Manual Cold-Vapor Technique). SW-846 Method 7470A, 1994.
20. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique). SW-846 Method 7471A, 1994.
21. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Selenium (Atomic Absorption, Borohydride Reduction). SW-846 Method 7742, 1994.
22. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Nonhalogenated Organics Using GC/FID. SW-846 Method 8015D, 2003.
23. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Phenols by Gas Chromatography. SW-846 Method 8041, 1996.

24. United States...

24. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Organochlorine Pesticides by Gas Chromatography. SW-846 Method 8081B, 2007.
25. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Polychlorinated Biphenyls (PCBs) by Gas Chromatography. SW-846 Method 8082A, 2007.
26. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS). SW-846 Method 8260C, 2006.
27. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry. SW-846 Method 8270D, 2014.
28. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Total and Amenable Cyanide: Distillation. SW-846 Method 9010C, 2004.
29. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Cyanide Extraction Procedure for Solids and Oil. SW-846 Method 9013A, 1996.
30. United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Cyanide in Waters and Extracts Using Titrimetric and Manual Spectrophotometric Procedures. SW-846 Method 9014, 2014. *gmd*