

ภาคผนวก ง
หนังสือรับรองการขึ้นทะเบียน
ห้องปฏิบัติการวิเคราะห์เอกชน

ที่ อก ๐๓๓๐(๔)/ ๘๓ ๐ ๒



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๐๔ ตุลาคม ๒๕๖๔

เรื่อง ยกเลิกบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท ยูโนเด็ค แอนนาลิติกส์ แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอคืนสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๒๕ กันยายน ๒๕๖๔

ตามคำขอที่ยังถึง บริษัท ยูโนเด็ค แอนนาลิติกส์ แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด
ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๑๔๕๕ สถานที่ตั้งเลขที่ ๓ ซอยอุดมสุข ๔๑ ถนนสุขุมวิท
แขวงบางจาก เขตพระโขนง กรุงเทพมหานคร ขอยกเลิกบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ยกเลิกเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน
จำนวน ๓ ราย ได้แก่

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| ๑) นางสาวอรียา ธรรมย์ | ทะเบียนเลขที่ ๖-๑๔๕๕-๖-๐๐๖๗ |
| ๒) นางสาวศรีเพชร ทองขาว | ทะเบียนเลขที่ ๖-๑๔๕๕-๖-๐๐๖๗ |
| ๓) นางสาวปริยา แคนชนม | ทะเบียนเลขที่ ๖-๑๔๕๕-๖-๐๐๖๗ |

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นางสาวปัทมวรรณ คุณประเสริฐ)
ผู้อำนวยการกองความปลอดภัยโรงงาน
ปฏิบัติงานกรมส่งเสริมโรงงานอุตสาหกรรม



ดำเนินการถูกต้อง

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๕๓๐ ๖๓๑๖ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๕๓๐ ๖๓๑๖ ต่อ ๒๑๑๕๕

ไปรษณีย์อิเล็กทรอนิกส์ sarabang@chw.mail.go.th



"อุตสาหกรรมก้าวไกล ประเพณีไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"

ที่ อก ๐๓๓๐(๑)/ ๖ ๙ ๗ ๓



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๕ สิงหาคม ๒๕๖๔

เรื่อง ยกเลิกบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท ยูโนเด็ค แอนนาลิติกส์ แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอคืนสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๘ สิงหาคม ๒๕๖๔

ตามคำขอที่ยังถึง บริษัท ยูโนเด็ค แอนนาลิติกส์ แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด
ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๑๔๕๕ สถานที่ตั้งเลขที่ ๓ ซอยอุดมสุข ๔๑ ถนนสุขุมวิท
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กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ยกเลิกเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน
จำนวน ๕ ราย ได้แก่

- | | |
|---------------------------|-----------------------------|
| ๑) นายคณิติน พงษ์ศรีกรรพ | ทะเบียนเลขที่ ๖-๑๔๕๕-๖-๐๐๖๗ |
| ๒) นายธีรวัฒน์ ธรรมสุวรรณ | ทะเบียนเลขที่ ๖-๑๔๕๕-๖-๐๐๖๗ |
| ๓) นายอาทิตย์ ตาภา | ทะเบียนเลขที่ ๖-๑๔๕๕-๖-๐๐๖๗ |
| ๔) นางสาวกมลชนก ปุณคำ | ทะเบียนเลขที่ ๖-๑๔๕๕-๖-๐๐๖๗ |
| ๕) นายวีระพงษ์ แสงท้านิ่ง | ทะเบียนเลขที่ ๖-๑๔๕๕-๖-๐๐๖๗ |

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายศิระ จันทโรจ)
ผู้อำนวยการกองความปลอดภัยโรงงาน
ปฏิบัติงานกรมส่งเสริมโรงงานอุตสาหกรรม



ดำเนินการถูกต้อง

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กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๕๓๐ ๖๓๑๖ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๕๓๐ ๖๓๑๖ ต่อ ๒๑๑๕๕

ไปรษณีย์อิเล็กทรอนิกส์ sarabang@chw.mail.go.th



"อุตสาหกรรมก้าวไกล ประเพณีไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"

ที่ อก ๐๓๓๐(๑)/ ๕ ๖ ๙ ๑



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๐๗ กรกฎาคม ๒๕๖๔

เรื่อง เปลี่ยนแปลงบุคลากรและสารมลพิษที่วิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท ยูโนเด็ค แอนนาลิติกส์ แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และขอคืนสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๙ พฤษภาคม ๒๕๖๔

ถึงที่ลงนามด้วย เอกสารแนบท้ายหนังสือเปลี่ยนแปลงบุคลากรและสารมลพิษที่วิเคราะห์
บริษัท ยูโนเด็ค แอนนาลิติกส์ แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด จำนวน ๒ ฉบับ

ตามหนังสือที่ยังถึง บริษัท ยูโนเด็ค แอนนาลิติกส์ แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด
ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ๖-๑๔๕๕ สถานที่ตั้งเลขที่ ๓ ซอยอุดมสุข ๔๑ ถนนสุขุมวิท
แขวงบางจาก เขตพระโขนง กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากรและสารมลพิษที่วิเคราะห์

ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๓ ราย

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| ๑) นายสุเชษฐ์ พันสิงห์ | ทะเบียนเลขที่ ๖-๑๔๕๕-๖-๐๐๐๓ |
| ๒) นางสาวสุกัญญา เอี่ยมเงิน | ทะเบียนเลขที่ ๖-๑๔๕๕-๖-๐๐๐๓ |
| ๓) นางสาวชานันดา กิมคม | ทะเบียนเลขที่ ๖-๑๔๕๕-๖-๐๐๐๓ |

๒. ให้เพิ่มผู้ควบคุมห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๓ ราย

- | | |
|---------------------|-----------------------------|
| นายสุเชษฐ์ พันสิงห์ | ทะเบียนเลขที่ ๖-๑๔๕๕-๖-๐๐๐๓ |
|---------------------|-----------------------------|

๓. ให้เพิ่มขอบข่ายสารมลพิษที่วิเคราะห์ในใบปดใบขึ้นทะเบียน และต้นตอสิ่งส่งตรวจด้วย

อนึ่ง หนังสือฉบับนี้จะออกอายุพร้อมหนังสือขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน
ในวันที่ ๖ กุมภาพันธ์ ๒๕๖๕

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายประสม ดำรงพร)
ผู้อำนวยการกองความปลอดภัยโรงงาน
ปฏิบัติงานกรมส่งเสริมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๕๓๐ ๖๓๑๖ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๕๓๐ ๖๓๑๖ ต่อ ๒๑๑๕๕

ไปรษณีย์อิเล็กทรอนิกส์ sarabang@chw.mail.go.th



"อุตสาหกรรมก้าวไกล ประเพณีไทยก้าวหน้า ร่วมกันพัฒนา อุตสาหกรรมสีเขียว"

เอกสารแนบท้ายหนังสือเปลี่ยนแปลงบุคลากรและสารมลพิษที่วิเคราะห์

บริษัท ยูโนเด็ค แอนนาลิติกส์ แอนด์ เอ็นจิเนียริ่ง คอนซัลแตนท์ จำกัด เลขทะเบียน ๖-๑๔๕๕

ที่ อก ๐๓๓๐(๑)/ ๕ ๖ ๙ ๑ ลงวันที่ ๐๗ กรกฎาคม ๒๕๖๔

ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๑๑ รายการ

ป้าได้ยื่น จำนวน ๔ รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aluminum	Digestion, Inductively Coupled Plasma Method ⁽¹⁾
2	Copper	1) Digestion, Flame Atomic Absorption Spectrometric Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽¹⁾
3	Iron	1) Digestion, Flame Atomic Absorption Spectrometric Method ⁽¹⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽¹⁾
4	Molybdenum	Digestion, Inductively Coupled Plasma Method ⁽¹⁾

ภาคเสีย (ปล่อยระบาย) จำนวน ๑ รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Oxides of Nitrogen	Absorption Sampling, Ion Chromatographic Method ⁽²⁾

ดิน จำนวน ๖ รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aluminum	Digestion, Inductively Coupled Plasma Method ^(3,4)
2	Copper	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(3,4) 2) Digestion, Inductively Coupled Plasma Method ^(3,4)
3	Iron	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(3,4) 2) Digestion, Inductively Coupled Plasma Method ^(3,4)
4	Molybdenum	Digestion, Inductively Coupled Plasma Method ^(3,4)
5	pH	Electrometric Method ⁽⁵⁾
6	TPH (C ₅ -C ₆)	Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(6,7)

เอกสารอ้างอิง

1. APHA, AWWA, WEF. Standard Methods for the Examination of Water and Wastewater. 24th ed. Washington, DC: APHA, 2023.
2. United States Environmental Protection Agency. Standards of Performance for New Stationary Sources. 40 CFR 60, Appendix A, 2023.



ดำเนินการถูกต้อง

3. United States...

๓๖) นายนาเคนทร์...

គណៈ វាងសាធិក្សា...

14 Benzo(a)pyrene

ลำดับ	สารเคมี	วิธีวิเคราะห์
14	Benzo(a)pyrene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
15	Benzo(g,h,i)perylene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
16	Beryllium	Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
17	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
19	Bromodichloromethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
20	Bromoform	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
21	Butanol	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
22	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
23	Cadmium	1) Digestion, Direct Air-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽⁴⁾ 3) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
25	Carbon disulfide	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
26	Carbon tetrachloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
27	Chlordane	1) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾

29 Chlorobenzene...

ลำดับ	สารเคมี	วิธีวิเคราะห์
29	Chlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
30	Chlorodibromomethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
31	Chloroform	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
33	Chromium	1) Digestion, Direct Air-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
34	Chromium (III)	1) Digestion, Direct Air-Acetylene Flame Method; Colorimetric Method; Calculation ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ⁽⁴⁾
35	Chromium (VI)	Colorimetric Method ⁽⁴⁾
36	Chrysene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
37	Cyanide	Distillation, Colorimetric Method ⁽⁴⁾
38	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾
39	DDD	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
40	DDE	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
41	DDT	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
42	Dibenz(a,h)anthracene	1) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾

43 Di-n-butyl phthalate...

ลำดับ	สารเคมี	วิธีวิเคราะห์
43	Di-n-butyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
44	1,2-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
45	1,3-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
46	1,4-Dichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
47	3,3'-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
48	1,1-Dichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
49	1,2-Dichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
50	1,1-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
51	cis-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
52	trans-1,2-Dichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
54	1,2-Dichloropropane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
55	1,3-Dichloropropane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
56	1,3-Dichloropropene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
57	Dieldrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
58	Diethyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾

61 2,4-Dinitrotoluene...

ลำดับ	สารเคมี	วิธีวิเคราะห์
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
63	Di-n-Octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
64	Endosulfan	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
65	Endrin	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
66	Ethylbenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
67	Fluoranthene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
68	Fluorene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
69	Heptachlor	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
70	Heptachlor epoxide	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
72	Hexachloro-1,3-butadiene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
73	n-Hexane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾

74 α-HCH...

ลำดับ	สารเคมี	วิธีวิเคราะห์
74	α-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
75	β-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
76	γ-HCH	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
79	Indeno(1,2,3-cd)pyrene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
81	Lead	1) Digestion, Direct Air-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Electrothermal Atomic Absorption Spectrometric Method ⁽⁴⁾ 3) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
82	Manganese	1) Digestion, Direct Air-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
83	Mercury	Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽⁴⁾
84	Methanol	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
85	Methoxychlor	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
86	Methyl bromide	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾

87 Methylene chloride..

ลำดับ	สารเคมี	วิธีวิเคราะห์
87	Methylene chloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
89	2-Methylnaphthalene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
90	Methyl tert-butyl ether	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
91	Naphthalene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
92	Nickel	1) Digestion, Direct Air-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
95	N-Nitrosodi-n-propylamine	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
96	Polychlorinated Biphenyls - PCB 1016 - PCB 1221 - PCB 1232 - PCB-1242 - PCB-1248 - PCB-1254 - PCB-1260	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
98	pH	Electrode Method ⁽⁴⁾
99	Phenanthrene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾

100 Phenol..

ลำดับ	สารเคมี	วิธีวิเคราะห์
100	Phenol	1) Distillation, Chloroform Extraction Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
101	Pyrene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
102	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
103	Silver	Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
104	Styrene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
105	1,1,2,2-Tetrachloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
106	Tetrachloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
107	Toluene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
108	Toxaphene	1) Liquid-Liquid Extraction, Gas Chromatographic Method ⁽⁴⁾ 2) Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
109	TPH (C ₈ - C ₉)	1) Purge and Trap, Gas Chromatographic Method ^(1,2,21) 2) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(1,2,21)
110	TPH (C ₁₀ - C ₁₆)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(1,2,21)
111	TPH (C ₁₇ - C ₃₃)	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(1,2,21)
112	1,2,4-Trichlorobenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
113	1,1,1-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
114	1,1,2-Trichloroethane	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
115	Trichloroethylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾

116 2,4,5-Trichlorophenol..

ลำดับ	สารเคมี	วิธีวิเคราะห์
116	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
117	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
118	1,3,5-Trimethylbenzene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
119	Vanadium	Digestion, Inductively Coupled Plasma Method ⁽⁴⁾
120	Vinyl acetate	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
121	Vinyl chloride	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
122	m-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
123	o-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
124	p-Xylene	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
125	Xylene (Total)	Purge and Trap Gas Chromatographic/Mass Spectrometric Method ⁽⁴⁾
126	Zinc	1) Digestion, Direct Air-Acetylene Flame Method ⁽⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽⁴⁾

ภาคผนวก (ต่อเนื่องจาก) จำนวน 25 รายการ

ลำดับ	สารเคมี	วิธีวิเคราะห์
1	Antimony	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽¹⁾
2	Arsenic	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ⁽¹⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽¹⁾
3	Cadmium	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ⁽¹⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽¹⁾
4	Carbon Monoxide	Instrumental Analyzer Method ⁽¹⁾
5	Chlorine	Isokinetic Sampling, Ion Chromatographic Method ⁽¹⁾
6	Chromium	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ⁽¹⁾

Chromium (ดี)..

ลำดับ	สารมลพิษ	วิธีวิเคราะห์
6	Chromium (หือ)	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽³⁾
7	Cobalt	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽³⁾
8	Copper	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ⁽³⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽³⁾
9	Cresol	Absorption Sampling, Gas Chromatographic Method ⁽²⁾
10	Dioxins/Furans	Isokinetic Sampling ⁽³⁾
11	Hydrogen Chloride	Isokinetic Sampling, Ion Chromatographic Method ⁽²⁾
12	Hydrogen Fluoride	Isokinetic Sampling, Ion Chromatographic Method ⁽²⁾
13	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ⁽³⁾
14	Lead	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ⁽³⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽³⁾
15	Manganese	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ⁽³⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽³⁾
16	Mercury	Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽³⁾
17	Nickel	1) Isokinetic Sampling, Digestion, Direct Air-Acetylene Flame Method ⁽³⁾ 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽³⁾
18	Opacity	Ringelmann's Method ⁽¹⁾
19	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic acid Method ⁽²⁾ 2) Instrumental Analyzer Method ⁽³⁾
20	Selenium	1) Isokinetic Sampling, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^(3,12) 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽³⁾
21	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method ⁽³⁾ 2) Instrumental Analyzer Method ⁽³⁾
22	Sulfuric Acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method ⁽³⁾

23 Total Suspended Particulate...

ลำดับ	สารมลพิษ	วิธีวิเคราะห์
23	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ⁽³⁾
24	Vanadium	Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method ⁽³⁾
25	Xylene	1) Bag Sampling, Gas Chromatographic Method ⁽²⁾ 2) Adsorption Sampling, Gas Chromatographic Method ⁽³⁾

ปริมาณของสารมลพิษในสิ่งแวดล้อม จำนวน 35 รายการ

ลำดับ	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3,22) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(10,23)
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3,4,14) 2) Digestion, Inductively Coupled Plasma Method ^(2,14)
3	Arsenic	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^(3,4,14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3,4,14) 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^(2,14) 4) Digestion, Inductively Coupled Plasma Method ^(2,14)
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3,4,14) 2) Digestion, Inductively Coupled Plasma Method ^(2,14)
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3,4,14) 2) Digestion, Inductively Coupled Plasma Method ^(2,14)
6	Cadmium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^(3,4,14) 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3,4,14) 3) Digestion, Flame Atomic Absorption Spectrometric Method ^(2,14) 4) Digestion, Inductively Coupled Plasma Method ^(2,14)
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3,22) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(10,23)

8 Chromium...

ลำดับ	สารมลพิษ	วิธีวิเคราะห์
8	Chromium	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^(3,4,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3,4,14) 3) Digestion, Flame Atomic Absorption Spectrometric Method ^(2,15) 4) Digestion, Inductively Coupled Plasma Method ^(2,14)
9	Chromium (III)	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation ^(3,4,15,17) 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation ^(3,4,15,17) 3) Digestion, Flame Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation ^(2,15,17) 4) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation ^(2,14,17)
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method ^(3,17) 2) Alkaline Digestion, Colorimetric Method ^(3,17)
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3,4,14) 2) Digestion, Inductively Coupled Plasma Method ^(2,14)
12	Copper	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^(3,4,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3,4,14) 3) Digestion, Flame Atomic Absorption Spectrometric Method ^(2,15) 4) Digestion, Inductively Coupled Plasma Method ^(2,14)
13	2,4-D	1) Waste Extraction, Gas Chromatographic Method ^(3,26) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(10,23)
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3,22) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(10,23)

15 DDE...

ลำดับ	สารมลพิษ	วิธีวิเคราะห์
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3,22) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(10,23)
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3,22) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(10,23)
17	Dieldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3,22) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(10,23)
18	Endrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3,22) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(10,23)
19	Heptachlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3,22) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(10,23)
20	Lead	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ^(3,4,15) 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3,4,14) 3) Digestion, Flame Atomic Absorption Spectrometric Method ^(2,15) 4) Digestion, Inductively Coupled Plasma Method ^(2,14)
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ^(3,22) 2) Ultrasonic Extraction, Gas Chromatographic Method ^(10,23)
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^(2,19) 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^(3,4,14) 3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^(2,19) 4) Digestion, Inductively Coupled Plasma Method ^(2,14)

Mercury (hือ)...

ลำดับ	สารมลพิษ	วิธีวิเคราะห์
22	Mercury (Hg)	5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method ⁽²⁾⁽⁸⁾
23	Methoxychlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ⁽³⁾⁽⁹⁾⁽²⁵⁾ 2) Ultrasonic Extraction, Gas Chromatographic Method ⁽¹⁰⁾⁽²³⁾
24	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ⁽³⁾⁽⁴⁾⁽¹⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾
25	Nickel	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ⁽³⁾⁽⁴⁾⁽¹⁵⁾ 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ⁽³⁾⁽⁴⁾⁽¹⁴⁾ 3) Digestion, Flame Atomic Absorption Spectrometric Method ⁽¹⁾⁽¹⁵⁾ 4) Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾
26	Polychlorinated Biphenyls - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260 - 2-Chlorobiphenyl - 2,3-Dichlorobiphenyl - 2,2',5'-Trichlorobiphenyl - 2,4',5'-Trichlorobiphenyl - 2,2',3,5'-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,3',4,4'-Tetrachlorobiphenyl - 2,2',3,4,5'-Pentachlorobiphenyl - 2,2',4,5,5'-Pentachlorobiphenyl - 2,3,3',4,6'-Pentachlorobiphenyl	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ⁽³⁾⁽⁹⁾⁽²⁶⁾ 2) Ultrasonic Extraction, Gas Chromatographic Method ⁽¹⁰⁾⁽²⁴⁾



Polychlorinated Biphenyls(๑๖)...

ลำดับ	สารมลพิษ	วิธีวิเคราะห์
27	Polychlorinated Biphenyls(๑๖) - 2,2',3,4,4',5'-Hexachlorobiphenyl - 2,2',3,4,5,5'-Hexachlorobiphenyl - 2,2',3,5,5',6'-Hexachlorobiphenyl - 2,2',4,4',5,5'-Hexachlorobiphenyl - 2,2',3,3',4,4',5'-Heptachlorobiphenyl - 2,2',3,4,4',5,5'-Heptachlorobiphenyl - 2,2',3,4,4',5,6'-Heptachlorobiphenyl - 2,2',3,4',5,5',6'-Heptachlorobiphenyl - 2,2',3,3',4,4',5,6'-Nonachlorobiphenyl	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽³⁾⁽⁹⁾⁽²⁸⁾ 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁰⁾⁽²⁸⁾
28	pH	Electrometric Method ⁽³⁾⁽¹⁾⁽²⁹⁾
29	Selenium	1) Waste Extraction, Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ⁽¹⁴⁾⁽²¹⁾ 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ⁽³⁾⁽⁴⁾⁽¹⁴⁾ 3) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ⁽⁷⁾⁽²¹⁾ 4) Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾
30	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ⁽³⁾⁽⁴⁾⁽¹⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾
31	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ⁽³⁾⁽⁴⁾⁽¹⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾

32 Toxaphene...

ลำดับ	สารมลพิษ	วิธีวิเคราะห์
32	Toxaphene	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method ⁽³⁾⁽⁹⁾⁽²¹⁾ 2) Ultrasonic Extraction, Gas Chromatographic Method ⁽¹⁰⁾⁽²³⁾
33	Trichloroethylene	1) Waste Extraction, Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽³⁾⁽¹²⁾⁽²⁷⁾ 2) Waste Extraction, Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ⁽³⁾⁽¹¹⁾⁽²⁷⁾ 3) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾⁽¹⁾⁽²⁷⁾ 4) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾⁽¹⁾⁽²⁷⁾
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ⁽³⁾⁽⁴⁾⁽¹⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾
35	Zinc	1) Waste Extraction, Digestion, Flame Atomic Absorption Spectrometric Method ⁽³⁾⁽⁴⁾⁽¹⁵⁾ 2) Waste Extraction, Digestion, Inductively Coupled Plasma Method ⁽³⁾⁽⁴⁾⁽¹⁴⁾ 3) Digestion, Flame Atomic Absorption Spectrometric Method ⁽⁷⁾⁽¹⁵⁾ 4) Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾

ดิน จำนวน 125 ไร่

ลำดับ	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	1) Ultrasonic Extraction, Gas Chromatographic Method ⁽¹⁰⁾⁽²⁵⁾ 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁰⁾⁽²⁸⁾
2	Acetone	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾⁽¹⁾⁽²⁷⁾
3	Aldrin	1) Ultrasonic Extraction, Gas Chromatographic Method ⁽¹⁰⁾⁽²³⁾ 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁰⁾⁽²⁸⁾
4	Anthracene	1) Ultrasonic Extraction, Gas Chromatographic Method ⁽¹⁰⁾⁽²⁴⁾

Anthracene (๑๖)...

ลำดับ	สารมลพิษ	วิธีวิเคราะห์
4	Anthracene (๑๖)	2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁰⁾⁽²⁸⁾
5	Antimony	Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁹⁾
6	Arsenic	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ⁽⁷⁾⁽¹⁴⁾ 2) Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾
7	Atrazine	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁰⁾⁽²⁸⁾
8	Barium	Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾
9	Benz(a)anthracene	1) Ultrasonic Extraction, Gas Chromatographic Method ⁽¹⁰⁾⁽²³⁾ 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁰⁾⁽²⁸⁾
10	Benzene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾⁽¹⁾⁽²⁷⁾ 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁾⁽¹⁾⁽²⁷⁾
11	Benzofluoranthene	1) Ultrasonic Extraction, Gas Chromatographic Method ⁽¹⁰⁾⁽²³⁾ 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁰⁾⁽²⁸⁾
12	Benzo(k)fluoranthene	1) Ultrasonic Extraction, Gas Chromatographic Method ⁽¹⁰⁾⁽²³⁾ 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁰⁾⁽²⁸⁾
13	Benzoic acid	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁰⁾⁽²⁸⁾
14	Benzo(a)pyrene	1) Ultrasonic Extraction, Gas Chromatographic Method ⁽¹⁰⁾⁽²³⁾ 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁰⁾⁽²⁸⁾
15	Benzo(g,h,i)perylene	1) Ultrasonic Extraction, Gas Chromatographic Method ⁽¹⁰⁾⁽²³⁾ 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ⁽¹⁰⁾⁽²⁸⁾
16	Beryllium	Digestion, Inductively Coupled Plasma Method ⁽⁷⁾⁽¹⁴⁾

17 Bis(2-chloroethoxy)ether...

ลำดับ	สารเคมี	วิธีวิเคราะห์
17	Bis(2-chloroethyl)ether	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
18	Bis(2-ethylhexyl)phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27)
20	Bromoforn	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27)
21	Butanol	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27)
22	Butyl benzyl phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
23	Cadmium	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,13) 2) Digestion, Inductively Coupled Plasma Method ^(7,14)
24	Carbazole	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
25	Carbon disulfide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27)
26	Carbon tetrachloride	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
27	Chlordane	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
28	p-Chloroaniline	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27)
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27)
31	Chloroforn	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27)
32	2-Chlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)

33 Chromium...

ลำดับ	สารเคมี	วิธีวิเคราะห์
33	Chromium	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,13) 2) Digestion, Inductively Coupled Plasma Method ^(7,14)
34	Chromium (III)	1) Digestion, Flame Atomic Absorption Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation ^(7A,13,17) 2) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation ^(7A,13,17)
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method ^(8,17)
36	Chrysene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
37	Cyanide	Extraction, Distillation, Colorimetric Method ^(29,30)
38	2,4-D	Ultrasonic Extraction, Gas Chromatographic Method ^(10,28)
39	DDD	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
40	DDE	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
41	DDT	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
42	Dibenz(a,h)anthracene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
43	Di-n-butyl phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27)

45 1,3-Dichlorobenzene...

ลำดับ	สารเคมี	วิธีวิเคราะห์
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27)
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27)
47	3,3'-Dichlorobenzidine	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
48	1,1-Dichloroethane	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
49	1,2-Dichloroethane	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
50	1,1-Dichloroethylene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
51	cis-1,2-Dichloroethylene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
52	trans-1,2-Dichloroethylene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
53	2,4-Dichlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27)
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27)
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27)
57	Dieldrin	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)

58 Diethyl phthalate...

ลำดับ	สารเคมี	วิธีวิเคราะห์
58	Diethyl phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
59	2,4-Dimethylphenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
60	2,4-Dinitrophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
61	2,4-Dinitrotoluene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
62	2,6-Dinitrotoluene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
63	Di-n-Octyl phthalate	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
64	Endosulfan	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
65	Endrin	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
66	Ethylbenzene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
67	Fluoranthene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
68	Fluorene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
69	Heptachlor	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
70	Heptachlor epoxide	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28)

Heptachlor epoxide (๒๐)...

ลำดับ	สารเคมี	วิธีวิเคราะห์
70	Heptachlor epoxide (๗๖)	2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
71	Hexachlorobenzene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(10,27)
73	n-Hexane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(10,27)
74	α-HCH	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,21) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
75	β-HCH	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,25) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
76	γ-HCH	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,25) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
77	Hexachlorocyclopentadiene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
78	Hexachloroethane	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
79	Indeno(1,2,3-cd)pyrene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
80	Isophorone	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
81	Lead	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,14) 2) Digestion, Inductively Coupled Plasma Method ^(7,14)
82	Manganese	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,14) 2) Digestion, Inductively Coupled Plasma Method ^(7,14)

83 Mercury...

ลำดับ	สารเคมี	วิธีวิเคราะห์
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ⁽¹⁴⁾ 2) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method ⁽²⁰⁾
84	Methanol	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(10,27)
85	Methoxychlor	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,25) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
86	Methyl bromide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(10,27)
87	Methylene chloride	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(10,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
88	2-Methylphenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
89	2-Methylnaphthalene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
90	Methyl tert-butyl ether	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(10,27)
91	Naphthalene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,25) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
92	Nickel	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,14) 2) Digestion, Inductively Coupled Plasma Method ^(7,14)
93	Nitrobenzene	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
94	N-Nitrosodiphenylamine	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
95	N-Nitrosodi-n-propylamine	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
96	Polychlorinated Biphenyls - Aroclor 1016	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28)

Polychlorinated Biphenyls(๗๖).

ลำดับ	สารเคมี	วิธีวิเคราะห์
95	Polychlorinated Biphenyls(๗๖) - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260 Polychlorinated Biphenyls - 2-Chlorobiphenyl - 2,3-Dichlorobiphenyl - 2,2',5-Trichlorobiphenyl - 2,4',5-Trichlorobiphenyl - 2,2',3,5-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,3',4,4'-Tetrachlorobiphenyl - 2,2',3,4,5'- Pentachlorobiphenyl - 2,2',4,5,5'- Pentachlorobiphenyl - 2,3,3',4,6- Pentachlorobiphenyl - 2,2',3,4,4',5'- Hexachlorobiphenyl - 2,2',3,4,5,5'- Hexachlorobiphenyl - 2,2',3,5,5',6- Hexachlorobiphenyl - 2,2',4,4',5,5'- Hexachlorobiphenyl - 2,2',3,3',4,4',5- Heptachlorobiphenyl - 2,2',3,4,4',5,5'- Heptachlorobiphenyl - 2,2',3,4,4',5,6- Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6- Nonachlorobiphenyl	2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28) Ultrasonic Extraction, Gas Chromatographic Method ^(10,28)

97 Pentachlorophenol...

ลำดับ	สารเคมี	วิธีวิเคราะห์
97	Pentachlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
98	Phenanthrene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,25) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
99	Phenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
100	Pyrene	1) Ultrasonic Extraction, Gas Chromatographic Method ^(10,25) 2) Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(10,28)
101	Selenium	1) Digestion, Hydride Generation/Atomic Absorption Spectrometric Method ^(7,21) 2) Digestion, Inductively Coupled Plasma Method ^(7,14)
102	Silver	Digestion, Inductively Coupled Plasma Method ^(7,14)
103	Styrene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(10,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(10,27)
105	Tetrachloroethylene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(10,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
106	Toluene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(10,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
107	Toxaphene	Ultrasonic Extraction, Gas Chromatographic Method ^(10,23)
108	TPH (C ₁₀ -C ₁₄)	1) Purge and Trap, Gas Chromatographic Method ^(10,27) 2) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(10,27)
109	TPH (C ₁₄ -C ₁₈)	Ultrasonic Extraction, Gas Chromatographic Method ^(10,22)
110	TPH (C ₁₈ -C ₂₁)	Ultrasonic Extraction, Gas Chromatographic Method ^(10,22)

111 1,2,4-Trichlorobenzene

ลำดับ	สารเคมี	วิธีวิเคราะห์
111	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27)
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27)
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27)
114	Trichloroethylene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
115	2,4,5-Trichlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(13,28)
116	2,4,6-Trichlorophenol	Ultrasonic Extraction, Gas Chromatographic/Mass Spectrometric Method ^(13,28)
117	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27)
118	Vanadium	Digestion, Inductively Coupled Plasma Method ^(7,14)
119	Vinyl acetate	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27)
120	Vinyl chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27)
121	m-Xylene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
122	o-Xylene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
123	p-Xylene	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)
124	Xylene (Total)	1) Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^(13,27) 2) Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^(11,27)

125 Zinc...

ลำดับ	สารเคมี	วิธีวิเคราะห์
125	Zinc	1) Digestion, Flame Atomic Absorption Spectrometric Method ^(7,13) 2) Digestion, Inductively Coupled Plasma Method ^(7,14)

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- United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Cyanide Extraction Procedure for Solids and Oils. SW-846 Method 9013A, 2014.
- 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.
- United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. pH Electrometric Measurement. SW-846 Method 9040C, 2004.
- United States Environmental Protection Agency. Test Methods for Evaluation Solid Waste Physical/Chemical Methods. Soil and Waste pH. SW-846 Method 9045D, 2004.

ภาคผนวก จ
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List of Instruments Certification for Air Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration	Remark
Ambient									
1	Standard Gases (Mixture)	Nitrogen Dioxide Sulphur Dioxide Carbon Monoxide	Airgas	EB0159156 2015PSIG	Airgas an Air Liquide company	E04N99E15A01D3	6 Nov 23	6 Nov 26	-
2	Standard Gas	Total Hydrocarbons	Air Liquide	CC143232	Airgas an Air Liquide company	E03A199E15A006C	16 Oct 20	16 Oct 28	-
3	Nitrogen Dioxide Analyzer	Nitrogen Dioxide	Thermo Scientific	42i CM22387040	UAE Consultant Co.,Ltd.	20092024	20 Sep 24	6 Nov 26	-
5	Sulphur Dioxide Analyzer	Sulphur Dioxide	Thermo Scientific	43i 1180540065	UAE Consultant Co.,Ltd.	4092024	4 Sep 24	6 Nov 26	-
6	Carbon Monoxide Analyzer	Carbon Monoxide	Thermo	48C 48C-62494-335-5	UAE Consultant Co.,Ltd.	03092024	3 Sep 24	6 Nov 26	-
7	Total Hydrocarbons Analyzer	Total Hydrocarbons	Thermo Scientific	APHA-370 93JN1M1N9	UAE Consultant Co.,Ltd.	2092024	2 Sep 24	4 Aug 28	-

CERTIFICATE OF ANALYSIS

Grade of Product: EPA PROTOCOL STANDARD

Customer: AIR LIQUIDE (THAILAND) LTD
Part Number: E04N199E15A07D3
Cylinder Number: 124-402880224-1
Laboratory: 124 - Durham (SAP) - NC
PGVP Number: 822023
Gas Code: CO, NO, NOX, SO2, BALN
Reference Number: 122-402880224-1
Cylinder Volume: 144.0 CF
Cylinder Pressure: 2015 PSIG
Valve Outlet: 660
Certification Date: Nov 06, 2023
Expiration Date: Nov 06, 2026

Certification performed in accordance with EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2017) document EPA 800/R-12/001, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration material. All concentrations are on a metal-wet basis unless otherwise noted. The results relate only to the items listed. The report shall not be reproduced except in full without approval of the laboratory. Do not use this cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS				
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
NOX	45.00 PPM	46.78 PPM	G1	+/- 1.3% NIST Traceable
NITRIC OXIDE	45.00 PPM	46.77 PPM	G1	+/- 1.3% NIST Traceable
SULFUR DIOXIDE	45.00 PPM	42.89 PPM	G1	+/- 1.0% NIST Traceable
CARBON MONOXIDE	1000 PPM	988.9 PPM	G1	+/- 0.7% NIST Traceable
NITROGEN	Balance			
CALIBRATION STANDARDS				
Type	Lot ID	Cylinder No	Concentration	Uncertainty
NTRM	21060703	CC701954	48.41 PPM NITRIC OXIDE/NITROGEN	+/- 1.2%
PRM	0913620	15.01 PPM	NITROGEN DIOXIDE/AIR	+/- 1.5%
GMIS	124206688	CC322888	4.573 PPM NITROGEN DIOXIDE/NITROGEN	+/- 1.6%
NTRM	14061005	CC473180	49.02 PPM SULFUR DIOXIDE/NITROGEN	+/- 0.8%
NTRM	14060154	CC438961	990.3 PPM CARBON MONOXIDE/NITROGEN	+/- 0.6%
The SOA, NTRM, PRM, or GMIS values above are only in reference to the GAS used in the assay and not part of the analysis.				
ANALYTICAL EQUIPMENT				
Instrument/Make/Model	Analytical Principle			
Nicolet ISS50 AUP2010249 CO	FTIR			
Nicolet ISS50 AUP2010249 NO	FTIR			
Nicolet ISS50 AUP2010249 NO2	FTIR			
Nicolet ISS50 AUP2010249 SO2	FTIR			
Last Multipoint Calibration				
Oct 11, 2023				
Oct 11, 2023				
Oct 11, 2023				

Test Data Available Upon Request

NOTES: GROSS WEIGHT: 28.4 kg

NET WEIGHT: 4.7 kg



Signature on file

Approved for Release

Page 1 of 1

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number: ED3A199E15A006C
Cylinder Number: CC143232
Laboratory: 124 - Plumsteadville - PA
PGVP Number: A12020
Gas Code: CH4, PPN, BALN
Reference Number: 160-401908379-1
Cylinder Volume: 144.0 CF
Cylinder Pressure: 2016 PSIG
Valve Outlet: 590
Certification Date: Oct 16, 2020
Expiration Date: Oct 16, 2028

Certification performed in accordance with EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2017) document EPA 800/R-12/001, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration material. All concentrations are on a metal-wet basis unless otherwise noted. Do not use this cylinder below 100 psig, i.e. 0.7 megapascals.

DO NOT USE THIS CERTIFICATE BEYOND 100 MPH, 11.5% MOISTURE, 11.5% MOISTURE

ANALYTICAL RESULTS					
Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
METHANE	4000 PPM	4619 PPM	G1	+/- 1.0% NIST Traceable	10/16/2020
PROPANE	4000 PPM	4008 PPM	G1	+/- 0.7% NIST Traceable	10/09/2020
AIR	Balance				
CALIBRATION STANDARDS					
Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	0301D405	N070090	4878 PPM PROPANE/NITROGEN	+/- 0.6%	Dec 02, 2021
NTRM	170608	CC180290	0.997 % METHANE/NITROGEN	+/- 0.4%	Aug 23, 2023
ANALYTICAL EQUIPMENT					
Instrument/Make/Model	Analytical Principle				Last Multipoint Calibration
MKS FTIR -CH4 - 000028781	FTIR				Oct 14, 2020
Nicolet 6700 APW1100361 CH4	FTIR				Sep 16, 2020

Test Data Available Upon Request

NOTES: NET WEIGHTS: 4.865kg

GROSS WEIGHTS: 27.369kg

PO# 3220003825



Signature on file
Approved for Release

เอกสารไม่ควบคุม

MULTI-POINT GAS TEST REPORT

Test Date : Sep 28, 2024

Equipment : Gas Analyzer (NO₂)
Manufacturer : Thermo Scientific

Model : 421
Serial Number : CH22387040

Standard Gas Concentration
Sulphur Dioxide (SO₂) 42.89
Nitric Oxide (NO) 46.77
Methane (CH₄) -
Carbon Monoxide (CO) 965.9
Cylinder No. : ER01159156
Expiration Date : Nov 6, 2026

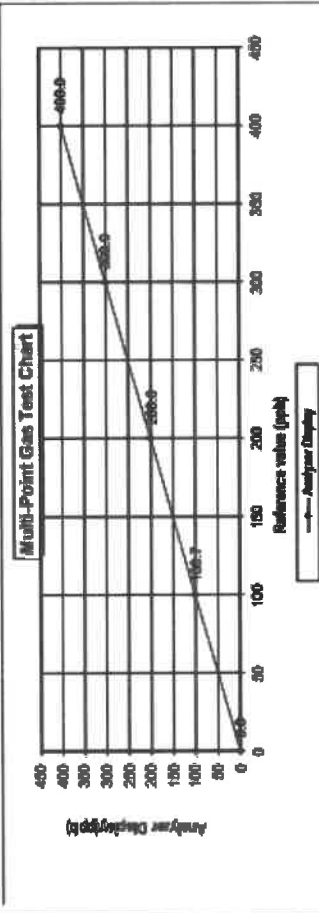
Dilutor Detail
Manufacturer : PPM
Model : PPM
Serial Number : PPM

Thermo Scientific
1461
11805-40071

Multi-point gas test data

Reference Value (ppb)	Analyzer Display (ppb)	Difference Error	Percent Error	[% Error]
Level 1 Zero	0.0	0.00	0.00	0.00
Level 2 20.00%	100.0	0.70	0.70	0.70
Level 3 40.00%	200.0	0.60	0.30	0.30
Level 4 60.00%	300.0	0.90	0.30	0.30
Level 5 80.00%	400.0	0.00	0.00	0.00
Average Difference (%)				0.26

Remark : Measuring Range
: Acceptable Limit \pm 5%



Calculate by
MChan. C
20 9 2587

Approve by
P. Kham
20 Sep 2024

MULTI-POINT GAS TEST REPORT

Test Date : Sep 4, 2024

Equipment : Gas Analyzer (SO₂)
Manufacturer : Thermo Scientific

Model : 431
Serial Number : 1180540065

Standard Gas Concentration
Sulphur Dioxide (SO₂) 42.89
Nitric Oxide (NO) 46.77
Methane (CH₄) -
Carbon Monoxide (CO) 965.9
Cylinder No. : ER01159156
Expiration Date : Nov 06, 2026

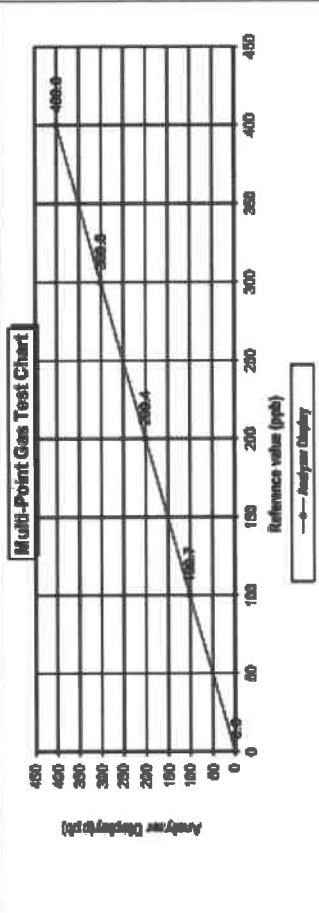
Dilutor Detail
Manufacturer : PPM
Model : PPM
Serial Number : PPM

Thermo Scientific
1461
11805-40071

Multi-point gas test data

Reference Value (ppb)	Analyzer Display (ppb)	Difference Error	Percent Error	[% Error]
Level 1 Zero	0.0	0.00	0.00	0.00
Level 2 20.00%	100.0	100.7	0.70	0.70
Level 3 40.00%	200.0	200.4	0.40	0.20
Level 4 60.00%	300.0	300.8	0.80	0.27
Level 5 80.00%	400.0	0.00	0.00	0.00
Average Difference (%)				0.23

Remark : Measuring Range
: Acceptable Limit \pm 5%



Calculate by
MChan. C
4 9 2587

Approve by
P. Kham
4 Sep 2024



Test Date : Sep 2, 2024

MULTI-POINT GAS TEST REPORT

Equipment : Hydrocarbon Analyzer

Model : AM-370

Manufacturer : HORIBA

Serial Number : 93N11M19

Standard Gas Concentration

Sulphur Dioxide (SO₂) : PPM

Nitric Oxide (NO) : PPM

Methane (CH₄) : 39.8 PPM

Carbon Monoxide (CO) : PPM

Cylinder No. : D024432

Expiration Date : Aug 4, 2028

Diluter Detail

Manufacturer : PPM

Model : PPM

Serial Number : PPM

Multi-point gas test data

Reference Value (ppm)	Analyzer Display (ppm)	Difference Error	Percent Error	% Error
Level 1 Zero 0.00	0.37	0.37	0.37	0.37
Level 2 80.00%	39.56	-40.44	-1.11	1.11

Remark : Measuring Range 50.00 ppm
Acceptable Limit \pm 5%

Multi-Point Gas Test Chart

Reference value (ppm)

Analyzer Display (ppm)

Acceptable Limit \pm 5%

Calculate by

Signature by

3 Sep 2, 2024

Test Date : Sep 3, 2024

MULTI-POINT GAS TEST REPORT

Equipment : Gas Analyzer (CO)

Model : 481

Manufacturer : Thermo Scientific

Serial Number : CH08140004

Standard Gas Concentration

Sulphur Dioxide (SO₂) : 42.89 PPM

Nitric Oxide (NO) : 46.77 PPM

Methane (CH₄) : PPM

Carbon Monoxide (CO) : 965.9 PPM

Cylinder No. : E901159156

Expiration Date : Nov 06, 2028

Diluter Detail

Manufacturer : Thermo Scientific

Model : 1461

Serial Number : 11080540071

Multi-point gas test data

Reference Value (ppm)	Analyzer Display (ppm)	Difference Error	Percent Error	% Error
Level 1 Zero 0.0	0.0	0.0	0.0	0.0
Level 2 20.00%	10.0	0.5	4.8	4.8
Level 3 40.00%	20.9	0.9	4.3	4.3
Level 4 60.00%	30.7	0.7	2.3	2.3
Level 5 80.00%	40.0	0.0	0.0	0.0

Remark : Measuring Range 50.0 ppm
Acceptable Limit \pm 5%

Multi-Point Gas Test Chart

Reference value (ppm)

Analyzer Display (ppm)

Acceptable Limit \pm 5%

Calculate by

Signature by

3 Sep 3, 2024

MULTI-POINT GAS TEST REPORT

Test Date : July 4, 2025

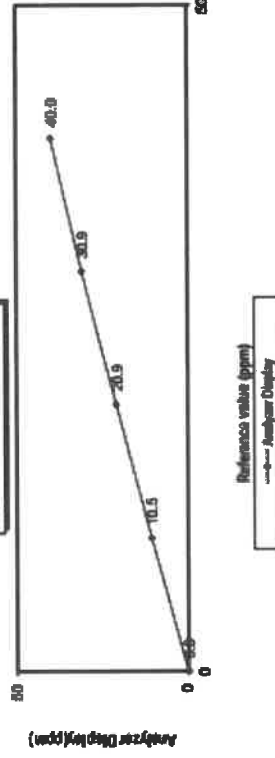
Equipment : Gas Analyzer (CO) Model : 48C
 Manufacturer : Thermo Environmental Instruments Serial Number : 48C-62494-335/5

Standard Gas Concentration Diluter Detail
 Sulphur Dioxide (SO₂) 42.69 PPM Manufacturer : Thermo Scientific
 Nitric Oxide (NO) 46.77 PPM Model : 1461
 Methane (CH₄) - PPM Serial Number : 11805-40071
 Carbon Monoxide (CO) 965.9 PPM
 Cylinder No. : F801159156
 Expiration Date : Nov 05, 2026

Multi-point gas test data

Reference Value (ppm)		Analyzer Display (ppm)	Difference Error	Percent Error	[% Error]
Level 1	Zero	0.0	0.0	0.0	0.0
Level 2	20.00%	10.5	0.5	4.8	4.8
Level 3	40.00%	20.9	0.9	4.3	4.3
Level 4	60.00%	30.9	0.9	2.9	2.9
Level 5	80.00%	40.0	0.0	0.0	0.0
Remark : Measuring Range		50.0 ppm	Average Difference (%)		2.40

Multi-Point Gas Test Chart



Calculated by
 Signature of
 4 July 2568

Approved by
 Signature of
 4 July 2025

List of Instrument Certificates for Environmental Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration*
1	Analytical Balance	FAT OIL AND GREASE	Mettler Toledo	AB204-S/FACT / 1129361010	United Analyst and Engineering Consultant Co., Ltd.	250422 1 BL002 25	23/4/2025	22/4/2026
2	Analytical Balance	TOTAL DISSOLVED SOLIDS	Mettler Toledo	XSR205DU / C210685394	National Food Institute,Ministry of Industry, Thailand	25022226-002-01	20/3/2025	19/3/2026
3	Analytical Balance	SUSPENDED SOLIDS	Mettler Toledo	XSR205DU / C009071872	National Food Institute,Ministry of Industry, Thailand	25022226-001-01	20/3/2025	19/3/2026
4	DO Meter	BIOCHEMICAL OXYGEN DEMAND	YSI	5100 / 11B 101863	Technology Promotion Association (Thailand-Japan)	25TW29	17/2/2025	16/2/2026
5	Incubator	TOTAL COLIFORM BACTERIA	Binder	KB400 / 202200000000391	National Food Institute Ministry of Industry, Thailand	2503287-002-01	5/6/2025	4/6/2026
6	Kjeltec System Distilling Unit	TOTAL KJELDAHL NITROGEN	Foss Tecator (Labtec)	KT200 / 91790524	FOSS South East Asia	13319	27/1/2025	26/1/2026
7	Kjeltec Distillation Unit	TOTAL KJELDAHL NITROGEN	FOSS	Kjeltec 8100 / 91889052	FOSS South East Asia	13854	24/2/2025	23/2/2026
8	pH Meter	pH	Horiba	LAQUA-PH210 / HAOC0025	technology promotion association (thailand-japan	25CH261	26/2/2025	25/3/2026

Due Date of Calibration* : Based on the annual calibration plan. At least 1 time per year.

Certificate of Calibration

Certificate No.: 250422-1-BL002-25

Code No.: BL002-25

Page: 1 of 3

Customer Name: United Analyst and Engineering Consultant Co., Ltd.
Address: 3 Soi Udomsuk 41, Sukhumvit Rd., Bang Chak, Phrakhanong, Bangkok 10260

Equipment: Electronic Balance

Manufacturer: Mettler Toledo

Model: AB204-S/FACT

Serial No.: 1129361010

Asset No.: UAE.WAS.002/2552

Building: N/A **Floor:** 1 **Room:** 107

Received Date: April 22, 2025

Date of Calibration: April 23, 2025

Calibration Conditions:
 Temperature: 22.8 °C to 23.4 °C
 Humidity: 54.8 % to 68.9 %
 Pressure: 756.6 mmHg to 758.2 mmHg

Calibrated by: Sakkarin Srihang

Approved by: Suwit Chotnok

Signature:

Issued Date: April 25, 2025

Note: 1) The uncertainties are for a confidence probability of approximately 95%

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

3) This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the United Analyst and Engineering Consultant Co., Ltd. (LAE)

เอกสารไม่ควบคุม

Certificate No.: 250422-1-BL002-25

Code No.: BL002-25

Page: 2 of 3

Equipment: Electronic Balance **Manufacturer:** Mettler Toledo
Model: AB204-S/FACT **Repeatability:** 0.0001 g
Serial No.: 1129361010 **ID No.:** UAE.WAS.002/2552
Max. Capacity: 220 g
Calibration Date: April 23, 2025
Condition As-Received: In Condition

Condition of Equipment:

Condition of This Result of Calibration:

1. Calibration Method: This instrument was calibrated by method UAE.CP.CAL.006 In-House Method based on UKAS Lab 14: 2022

2. Reference Standards:

Reference Standards	Model	Serial No.	Calibrated By	Certificate No.	Traceability	Due Date
Standard Weight Class E2 (OIML)	1 mg to 1 kg	8749109122	AMARC	25-009359	Mettler-Toledo	21-Jan-27
	1 mg to 200 g	11119512	AMARC	24-013910	Mettler-Toledo	04-Feb-26
Instrument	Model	Serial No.	Calibrated By	Certificate No.	Traceability	Due Date
Thermo-Hygro-Baro Meter	AMB-3825D	AK46457	SUCCESS	SGS-H-00977/67	Success Gateway	21-Apr-25
Thermo-Hygro-Baro Meter	AMB-3825D	AK46457	TPA	25P795	TPA	23-Feb-26

3. This certification is traceable to SI Unit

4. This certification is certified only for the instrument we calibrated

5. This result of calibration was found accurate as shown on date and place of calibration only.

6. Through the reference standard laboratory of AMARC 25-009359 Calibration 0152

Calibration Result:

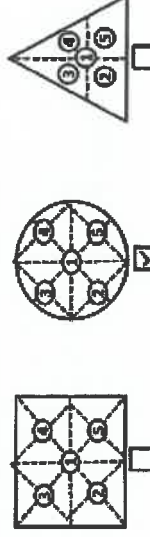
1. Repeatability of Reading:

Nominal Value (g)	Standard Deviation of Reading (g)
200*	0.000048

2. Eccentric or off-center loading

A mass of 100 g was placed and moved to various positions on pan

The balance reading obtained is given in the table.



1	2	3	4	5	Maximum Difference (g)
100.0000	99.9996	99.9997	100.0003	100.0005	0.0005

เอกสารไม่ควบคุม

Calibration Certificate

Certificate No.: 2502226-002-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Soi Udomsuk 41, Sukhumvit Road,
 Bangochai, Prathanong, Bangkok 10260

Page 1 of 4

Equipment:

Manufacturer: METTLER TOLEDO

Model: XSR2050U

Serial No.: Q210685394

ID No.: UAE.WAO.010/2565

Order No.: 2502226

Operation No.: 2502226-002

Date of Receipt: 19 March 2025

Date of Calibration: 20 March 2025

Calibrated by
Mr. Yotkin Charoensuk

Principles

Approved by Dr N. Wignesh
(Mr. Pharasbat Tharilt)

Manager, Division of Calibration Laboratory

Responsible for the Technical Management Team

25 March 2025

Date of Issue:

The uncertainties are for a confidence probability of approximately 95%

This Certificate is issued in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Scheme which has assessed the measurement capability of the laboratory and its traceability to recognized national standards and to the units of measurement realized at the corresponding national standards laboratory. This certificate may not be reproduced other than in full, without the prior written approval of the National Food Institute.

ENCLOSURE: 01 Date: 20-04-65

Calibration Result:

Calibration Range 0 - 200 g

Calibration Adjustment: Internal Calibration

3. Error of indication from nominal or conventional mass values:

3. Error of indication from nominal or conventional values						
Nominal Value (g)	Reference Value (g)	Indication (g)	Correction (g)	Uncertainty (\pm mg)	Coverage Factor <i>k</i>	
Unloaded	0.000000	0.0000	0.0000	0.10	2.05	
	0.01	0.0100025	0.0099	0.0001	0.10	2.05
	0.05	0.0500036	0.0500	0.0000	0.10	2.05
	0.1	0.1000012	0.0999	0.0001	0.10	2.05
	0.5	0.5000039	0.5000	0.0000	0.10	2.05
1	1.0000105	1.0000	0.0000	0.10	2.05	
10	10.000010	10.0000	0.0000	0.11	2.04	
40	40.000076	40.0000	0.0000	0.14	2.00	
50	50.000056	50.0000	0.0001	0.13	2.00	
80	80.000107	80.0000	0.0001	0.18	2.00	
100	100.000109	99.9999	0.0002	0.17	2.00	
120	120.00015	119.9999	0.0003	0.21	2.00	
150	150.000163	149.9998	0.0003	0.24	2.00	
160	160.000175	159.9997	0.0005	0.26	2.00	
200	200.000129	199.9998	0.0004	0.30	2.00	

4. Effect of Tare test

Test Load (g)	Test Load (g)	Indication (g)	Correction (g)
100	20.000041	19.9999	0.0001
	40.000076	39.9998	0.0002
	60.000066	59.9997	0.0003
	80.000167	79.9999	0.0002
	100.000168	100.0004	-0.0003

Demzufolge

The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor

o-o-End-o-o

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Calibration Report

Certificate No.: 25022236-002-01

Equipment:

Electronic Balance

Model: XS205DU

Serial No.: C210685394

Capacity: 82 g / 220 g

Manufacturer: METTLER TOLEDO

Resolution: 0.00001 g / 0.0001 g

ID No.: UAE-WAO.0102565

Date of Calibration: 20 March 2025

Environment Condition: Ambient Temperature: 21.2 ± 0.6 °C Relative Humidity: 48 ± 3.5 %

Place of Calibration: 208 Balance Room, UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.

Condition of Equipment: Good Condition

Condition of This Results of Calibration:

1. Calibration Method: NFI Method W-MA-001 In-House Method based on UKAS Lab 14: 2019

2. Reference Standards:

Reference Standard

Standard Weight Class E2 1mg to 200g

Instrument

Thermo-Hygro Meter

3. This certification is traceable to SI UNIT

4. This certificate was certified only for the instrument we calibrated

5. This result of calibration was found accurate as shown on here and place of calibration only.

Calibration Results:

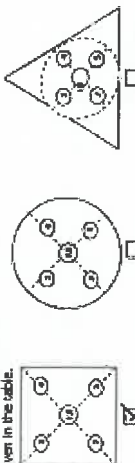
1. Repeatability of Reading:

Normal Value (g)	Standard Deviation of Reading (g)
40	0.0000042
80	0.0000042
100	0.000000
200	0.000000

2. Off-Center Error:

A mass of 100 g was placed and moved to various position on pan.

The balance reading obtained is given in the table.



1 (g)	2 (g)	3 (g)	4 (g)	5 (g)	6 (g)	(Maximum Difference) (g)
100.0001	100.0001	100.0001	100.0001	100.0001	100.0001	0.0000

for N. Nijarabot

Page 2 of 4

Calibration Report

Certificate No.: 25022236-002-01

Equipment:

Electronic Balance

Model: XS205DU

Serial No.: C210685394

Capacity: 82 g / 220 g

Manufacturer: METTLER TOLEDO

Resolution: 0.00001 g / 0.0001 g

ID No.: UAE-WAO.0102565

Date of Calibration: 20 March 2025

Calibration Results: (Continued)

Calibration Ranges: 0-80 g

Calibration Adjustments: Internal Calibration

3. Departure from Nominal Values (Range: 0 - 82 g ; Resolution: 0.00001 g)

Normal Value (g)	Standard Value (g)	Average Reading (g)	Correction (g)	Uncertainty (± g)	Coverage Factor k
Unloaded	0.000000	0.00000	0.00000	0.0000007	2.00
0.001	0.001003	0.00100	0.00000	0.0000090	2.00
0.005	0.005002	0.00501	-0.00001	0.0000092	2.00
0.01	0.010003	0.01002	-0.00002	0.0000089	2.00
0.05	0.050006	0.05001	-0.00001	0.0000096	2.00
0.1	0.100011	0.10002	-0.00001	0.000011	2.00
0.5	0.500016	0.50004	-0.00002	0.000014	2.00
1	1.000013	1.00005	-0.00005	0.000016	2.00
2	2.000023	2.00006	-0.00004	0.000017	2.00
5	5.000015	5.00006	-0.00005	0.000020	2.00
10	10.000009	10.00005	-0.00004	0.000026	2.00
20	20.000000	20.00007	-0.00007	0.000037	2.00
30	30.000009	30.00009	-0.00005	0.000050	2.00
50	50.000028	50.00008	-0.00005	0.000068	2.00
80	80.000057	80.00013	-0.00006	0.00011	2.00

for N. Nijarabot

Page 3 of 4

Calibration Report

Certificate No.: 2502226-002-01
Equipment: Electronic Balance
Model: XSR2050U
Serial No.: C210685384
Capacity: 82 g / 220 g

Manufacturer: METTLER TOLEDO
Resolution: 0.0001 g / 0.0001 g
ID No.: UAE-WAO.012/2555

Page 4 of 4

Date of Calibration: 20 March 2025

Calibration Results: (Continued)

Calibration Range: >80-200 g

Calibration Adjustment: Internal Calibration

3. Departure from Nominal Value: (Range: >80 - 200 g ; Resolution: 0.0001 g)

Nominal Value (g)	Standard Value (g)	Average Reading (g)	Correction (g)	Uncertainty (± g)	Coverage Factor k
90	90.00010	90.0002	-0.0001	0.00015	2.00
100	100.00006	100.0001	0.0000	0.00016	2.00
110	110.00007	110.0002	-0.0001	0.00017	2.00
120	120.00009	120.0002	-0.0001	0.00018	2.00
130	130.00010	130.0002	-0.0001	0.00019	2.00
140	140.00013	140.0002	-0.0001	0.00019	2.00
150	150.00009	150.0002	-0.0001	0.00021	2.00
160	160.00010	160.0002	-0.0001	0.00022	2.00
170	170.00012	170.0002	-0.0001	0.00023	2.00
200	200.00013	200.0002	-0.0001	0.00028	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 %.

End

FS-012 Revision: 01 Date: 20-04-25

Calibration Certificate

Certificate No.: 2502226-001-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Soi Udomsak 41, Sukhumvit Road,
Bangchack, Prakhomong, Bangkok 10260

Page 1 of 4

Equipment: Electronic Balance

Manufacturer: METTLER TOLEDO

Model: XSR2050U

Serial No.: C009071872

ID No.: UAE-WAO.012/2563

Order No.: 2502226

Operation No.: 2502226-001

Date of Receipt: 19 March 2025

Date of Calibration: 20 March 2025

Calibrated by Mr.Yodin Charoenuek
Scientist

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

Date of Issue: 25 March 2025

The uncertainties are for a confidence probability of approximately 95%

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

FS-012 Revision: 01 Date: 20-04-25

Calibration Report

Certificate No.: 25022226-001-01
Equipment: Electronic Balance
Manufacturer: METTLER TOLEDO
Model: XS205DU
Resolution: 0.00001 g / 0.0001 g
Serial No.: C005071872
ID No.: UAE-WAO.01272563
Capacity: 82 g / 220 g

Page 2 of 4

Date of Calibration: 20 March 2025
Environment Condition: Ambient Temperature: 21.2 ± 0.6 °C Relative Humidity: 48 ± 3.5 %
Place of Calibration: 208 Balance Room, UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.
Condition of Equipment: Good Condition
Condition of This Results of Calibration:

1. Calibration Method: NFI Method W-14-001 In-House Method based on UKAS Lab 14: 2019

2. Reference Standards:

Reference Standard	Model	Serial No.	Calibrated By	Certificate No.	Due Date
Standard Weight Class E2	1mg to 200g	BS15567572	TCS	M20411005	19 April 2025
Instrument	Model	Serial No.	Calibrated By	Certificate No.	Due Date
Thermo-Hygro Meter	608-H1	NFLBTH-Q17723	Quality Return	Q1925-0542	10 February 2026

3. This certification is traceable to SI UNIT

4. This certificate was certified only for the instrument was calibrated.

5. This result of calibration was found accurate as shown on date and place of calibration only.

Calibration Results

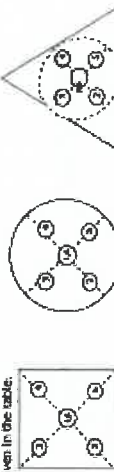
1. Repeatability of Reading:

Nominal Value (g)	Standard Deviation of Reading (g)
40	0.0000052
80	0.0000042
100	0.0000030
200	0.0000009

2. Off-Center Error:

A mass of 100 g was placed and moved to various position on pan.

The balance reading obtained is given in the table:



1	2	3	4	5	6	(Maximum Difference)
(g)	(g)	(g)	(g)	(g)	(g)	(g)
100.0001	100.0001	100.0001	100.0001	100.0001	100.0002	0.0001

for N. Nijmabadi

ISO 17025 Revision: 01 Date: 20-04-65



Calibration Report

Certificate No.: 25022226-001-01
Equipment: Electronic Balance
Manufacturer: METTLER TOLEDO
Model: XS205DU
Resolution: 0.00001 g / 0.0001 g
Serial No.: C005071872
ID No.: UAE-WAO.01272563
Capacity: 82 g / 220 g

Page 3 of 4

Date of Calibration: 20 March 2025

Calibration Results: (Continued)

Calibration Range: 0-80 g

Calibration Adjustment: Internal Calibration

3. Departure from Nominal Values: (Range: 0 - 82 g ; Resolution: 0.00001 g)

Nominal Value (g)	Standard Value (g)	Average Reading (g)	Correction (g)	Uncertainty (± g)	Coverage Factor k
Unloaded	0.00000	0.00000	0.00000	0.0000089	2.00
4.001	0.001003	0.00100	0.00000	0.0000092	2.00
4.005	0.005002	0.00500	0.00000	0.0000094	2.00
0.01	0.010003	0.01000	0.00000	0.0000091	2.00
0.05	0.049996	0.05000	0.00000	0.0000088	2.00
0.1	0.100011	0.10000	0.00001	0.000011	2.00
0.5	0.500016	0.50000	0.00002	0.000014	2.00
1	1.000003	1.00001	-0.00001	0.000016	2.00
2	2.000023	2.00005	-0.00003	0.000017	2.00
5	5.000015	5.00005	-0.00003	0.000021	2.00
10	10.000009	10.00005	-0.00004	0.000026	2.00
20	20.000030	20.00012	-0.00009	0.000037	2.00
30	30.000039	30.00012	-0.00008	0.000050	2.00
50	50.000028	50.00014	-0.00011	0.000068	2.00
80	80.000067	80.00020	-0.00013	0.00011	2.00

for N. Nijmabadi

ISO 17025 Revision: 01 Date: 20-04-65



Calibration Report

Certificate No.: 2502226-001-01

Equipment:

Electronic Balance
Model: XSR2050U
Serial No.: C095070172
Capacity: 82 g / 220 g
Manufacturer: METTLER TOLEDO
Resolution: 0.0001 g / 0.0001 g
ID No.: UAE.WAO.012/2563

Date of Calibration: 20 March 2025 Page 4 of 4

Calibration Results: (Continued)

Calibration Range: >80-200 g

Calibration Adjustment: Internal Calibration

3. Departure from Nominal Value (Range: >80 - 200 g ; Resolution: 0.0001 g)

Nominal Value (g)	Standard Value (g)	Average Reading (g)	Correction (g)	Uncertainty (± g)	Coverage Factor k
90	91.00010	90.0002	-0.0001	0.00015	2.00
100	100.00006	100.0001	0.0000	0.00016	2.00
110	110.00007	110.0001	0.0000	0.00017	2.00
120	120.00009	120.0002	-0.0001	0.00018	2.00
130	130.00010	130.0003	-0.0001	0.00019	2.00
140	140.00013	140.0002	-0.0001	0.00019	2.00
150	150.00009	150.0002	-0.0001	0.00021	2.00
160	160.00010	160.0002	-0.0001	0.00022	2.00
170	170.00012	170.0002	-0.0001	0.00023	2.00
200	200.00013	200.0002	-0.0001	0.00028	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 %.

----- End ----- for N. mugebath

FC-012-Revision-01 Date: 20-04-55



Certificate of Testing

Equipment: DO Meter
Manufacturer: YSI
Model: 5100
Serial No.: 11B 101883
ID No.: UAE.WAO.004/2564
Received Date: 14 February 2025
Test Date: 17 February 2025
Reference: 2502-0473DSC-1

Submitted by: United Analyst and Engineering Consultant Co.,Ltd.
3 Soi Udomauk 41, Sukhumvit Road, Bangchak,
Phrakhanong, Bangkok 10260

Laboratory Condition : Temperature (25 ± 6) °C
Humidity (50 ± 20) %
Test Procedure : In - house method : CP-QH8
by Comparison Technique with Azide Modification Method

Tested by: Walalak Sirtthearn
Approved by: *Sathip*
Approved Signatory

() Chakrit Wasawattana
() Ponpan Paipim
(✓) Sathip Meangmai

Issue Date: 18 February 2025

บันทึกผลการพารานกอบใบรับรองการสอบเทียบ (Verification of Certificate)

Certificate No. : 25TW29					Equipment : DO Meter		
Brand : YSI					Model : 5100		
Serial No. : 118 101863					ID No. : UAE.WAO.004/2554		
Calibration results							
Titration Method	Standart Deviation	DO meter Reading	Error%	Correction%	Error Total Error	Judgement	(Total Error < Judgement)
(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(± mg/L)	(mg/L)
8.22	0.0055	8.22	0.0000	0.0000	0.0	0.02	pass
ผู้รับใช้ : อีตรา บลูโปรแมก...					ผู้ทำสอบ : ...		
วันที่ : 28/02/2025					วันที่ : 28 มี.ค. 25		
หมายเหตุ :							

หน้าไม่ใช้

เอกสารไม่ควบคุม

\\nascentapp\hr\app_lab\lab-8\เครื่องSTRUMENT 61-Z\4-6\Cal%Data\UAE\HA\การสอบเทียบ\ใบรับรองการสอบเทียบ\ใบรับรอง DO meter WAO 004 2554

Cert.No.: 25TW29
Page.: 2 of 2

Condition of this result of calibration

1. Reference Standard Instruments :

This certification is traceable to the International System of Unit through the reference standards laboratory of Industrial Calibration Center, Technology Promotion Association (Thailand-Japan).

Instruments

Serial No.	ID No.	Certificate No.	Due Date
1. Burette	130BU10	23CG1172	22 Mar 2025
2. Balance	14233821	24MM131	04 July 2025

2. Standard Material :-

Material	Manufacturer	Lot No.	Assay
Sodium Thiosulfate 5-Hydrate AR	KEMAUS	2203162447	99.8%

Result : Dissolved Oxygen Meter Adjustment With Air 100 %
Dissolved Oxygen Probe No.: 24F100202

Titration Method (Azide Modification Method) (mg/L)	DO Meter Reading (mg/L)	Standard Deviation (mg/L)
8.22	8.22	0.0055

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

-ofo-



Calibration Certificate

Certificate No.: 2503287-002-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Soi Udomsak 41, Sathumvit Road,
 Bangchak, Prakhonong, Bangkok 10260

Page 1 of 3

Equipment: CHAMBER (Incubator)

Manufacturer: BINDER

Model: KB 400

Serial No.: 20220000000391

ID No.: UAE.MIC.029/2565


Order No.: 2503287

Operation No.: 2503287-002

Date of Receipt: 5 June 2025

Date of Calibration: 5 June 2025

Calibrated by Mr. Phrasphet Tuanjit
 Scientist

Approved by 
 (Miss Phrasphet Jaengkarnmit)
 Vice President, Department of Laboratory Services
 Responsible for the Technical Management Team

Date of Issue: 11 June 2025

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

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



Calibration Report

Certificate No.: 2503287-002-01
Equipment: CHAMBER (Incubator)
Model: KB 400
Serial No.: 20220000000391
Resolution: 0.1 °C
ID No.: UAE.MIC.029/2565
Manufacturer: BINDER
Date of Calibration: 5 June 2025

Page 2 of 3

Location: Room 302 Microbiology Laboratory, UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.

Environment Condition:
 Ambient Temperature (18 ± 1) °C
 Relative Humidity (53 ± 6) %
 Line Voltage (230 ± 5) Volt

Condition of this results of Calibration:

- This instrument was calibrated by Insert 13 standard thermometer into its chamber and calibration according to WTE-014 Based on TLAS G-20-1/02-08 (E); Guidelines for Calibration and Checks of Temperature Controlled Enclosures.
- The Temperature scale used was based on ITS - 90.
- All data show below were final values and the initial data may be obtained upon request.

2. Reference Standard Instrument :

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY59003377	2501168-001-01	13 January 2026	NATIONAL FOOD INSTITUTE
	RTD	CH-101-203 / STD-101-203			

3. This certificate is traceable to International System of Units (SI Units).

4. This certificate was certified only for the instrument we calibrated.

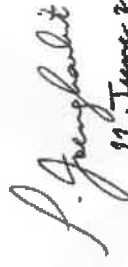
5. This result of calibration was found accurate as shown on date and place of calibration only.

6. Condition of Calibrated item : Good

UUC Description :

Time of Record 1 Hour 9 Minute At 35.0 °C
 Fresh air Damper ☒ Open ☐ Position ☐ Fan ☐ Close ☐ Fan ☐

7. Result of Calibration : ☒ Without adjustment ☐ After adjustment


 11 June 2025



FOSS

Customer Service Report

Date: 24 February 2025
 Job No.: 11735
 Instrument: KT8100

FOSS South East Asia
 3308 Srinak Building, 25th - 26th Floor, Unit No. 3308/50,
 Rama IV Road, Klongtoey, Bangkok, Thailand 10110

Report No.: 13854
 Customer: UAE
 Address: Bangkok
 Serial: 9187052

Start: 07:00
 Finish: 08:00
 Travel To Customer (hrs): 0.5
 Labour (hrs): 1.5
 Travel From Customer (hrs): 1.5

Application	Special	Job Type	Standard
Distributor	Courtesy Visit	Installation	Training
Digital Service	PMA Onboarded	Quote	In House
Internal	Warranty	Repair	PM
Investigate	Sales Support	Remote	Health Check Visit

PMA Type	Smartcare	Smartcare Advance	Smartcare Pro	FossCare
				N/A

Details of Work / Test	
2 PM KT8100 12.00	
- Test before PM	
- Cleaning KT8100, 35 mm replace	
- Washing plastic RUM	
- Test operation	
- Distillation 80 - 80 ml	
- Distillation 5 ml, 150 - 120 ml	
- Analysis 80 - 80 ml	
- All pass	

Part No.	Batch	Description	Qty
60031810	08-01-7024	Foss PM KT 12100, 1200 36ml	1

I confirm this report is accurate and complete

Signed Foss: [Signature]
 Name: [Blank]
 Signed Customer: [Signature]
 Name: [Blank]

*Remark: [Blank]
 Email: [Blank]
 Customer Contact: [Blank]
 Please scan QR code



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
 CORPORATE SERVICES 3: EQUIPMENT CALIBRATION AND TESTING SERVICES
 53/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
 TEL 0-2717-3000-29 FAX 0-2719-9484



Certificate of Calibration

Cert.No.: 25CH281
 Page.: 1 of 3

Equipment: pH Meter
 Manufacturer: Horiba
 Model: LAQUA-PH210
 Serial No.: HA0C0025
 ID No.: UAE.EFM.1172563(EFM.pH.07/83)
 Condition As-Received:
 Received Date: 25 February 2025
 Calibration Date: 26 to 28 February 2025
 Reference: 2502-0783WSC-1
 Submitted by: United Analyst and Engineering Consultant Co., Ltd.
 3 Soi Udomrak 41, Subhumvit Road,
 Bangkok, Prachinburi, Bangkok 10260

Ambient Temperature: (25 ± 2.5) °C
 Relative Humidity: (50 ± 15) %
 Calibration Procedure: In-house method:
 - CP-GH5 by direct measurement with DC voltage standard and direct measurement with certified reference material (CRM)
 - CP-GH5 by comparison with temperature standard

Calibrated by: Warakorn Lemgajabkul

Approved by: [Signature]
Approved Signature

() Chakrit Weemawijua
 () Ponpan Pajiam
 (✓) Saitip Meangmai
 Issue Date: 28 February 2025

The Uncertainty are for a confidence probability of approximately 95%
 This certificate may not be reproduced other than in full, except with the prior written
 Approval of the head of Corporate Services 3: Equipment Calibration and Testing Services.

เอกสารไม่ควบคุม



Cert.No.: 25CH261
Page.: 2 of 3

Condition of this calibration result

1. Reference Standard Instrument

Instrument	Serial No.	ID No.	Cert. No.	Due Date
1) Document Process Calibrator	54030049	130RC116	24E2759	25 Aug 2025
2) Ref. Standard Thermometer	48820354	110RC044	24I757	14 July 2025
- This Certification is traceable to SI Through Technology Promotion Association (Thailand - Japan)				
2. Certified Reference Materials				
: The measurement results are traceable to SI through Hach Lange GmbH Ltd., Deutsche Aufrechterhaltungsfabrik, Accredited No. D-904-15184-01-00				
: The measurement results are traceable to SI through CPA chem Ltd., ANSI-ASQ National Accreditation Board, Accredited No. A5-1835				

Buffer Solution	Manufacturer	Lot No.	Exp. date
pH 4.007	CPA chem	1066665	18 Jan 2027
pH 6.999	Hach Lange GmbH	G03220	29 Oct 2026
pH 10.010	CPA chem	1066669	18 Jan 2026

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

Calibration Results

Function : mV Measurement

Performing standard curve by Document Process Calibrator at pH (4.7)(7.10)

Unit Under Calibration	Nominal Value	Standard Voltage Input	Actual Reading		Uncertainty of Measurement (\pm mV)	Coverage factor k
			mV	pH		
pH Meter S/N: H40C0025	4.00	177.46	177.5	4.01	0.058	2.00
	7.00	0.00	0.0	7.02	0.058	2.00
	7.00	0.00	0.0	7.02	0.058	2.00
	10.00	-177.46	-177.5	10.01	0.058	2.00

เอกสารไม่ควบคุม



Cert.No.: 25CH261
Page.: 3 of 3

Calibration Results

Function : pH Measurement

Performing three buffers standard curve by using buffer nominal pH (4.7)(7.10)

Unit Under Calibration	Standard pH Buffer Solution	Actual pH Reading	Actual mV Reading (mV)	Uncertainty of pH Measurement (\pm)	Coverage factor k
pH Electrode S/N: Q9AG0214	4.007	4.01	178.4	0.0071	2.00
	6.999	7.00	4.1	0.0082	2.00
	6.999	7.00	3.0	0.0085	2.00
	10.010	10.01	-168.8	0.0082	2.00

Function : Temperature Measurement

(*) Without adjustment

This equipment was connected with Temperature Probe;

- Model : 9652-100
- Serial No. : Q9AG0214

Dimension of probe

- Length : 110 mm.

- Diameter : 16 mm.

- Immersion Depth : 80 mm.

Calibration Point ($^{\circ}$ C)	Standard Temperature ($^{\circ}$ C)	UUC* Reading ($^{\circ}$ C)	Error ($^{\circ}$ C)	Uncertainty of measurement (\pm $^{\circ}$ C)	Coverage factor k
15.0	15.002	15.0	-0.002	0.13	2.00
30.0	30.003	30.0	-0.003	0.13	2.00
45.0	45.002	44.9	-0.102	0.13	2.00

Remark - UUC* = Unit Under Calibration

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

-080-

เอกสารไม่ควบคุม

List of Instrument Certificates for Environmental Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration*
1	Incubator	LEGIONELLA SP.	Memmert	IPP260 / V616.0066	National Food Institute, Ministry of Industry, Thailand	2502229-002-01	19/3/2025	18/3/2026

Due Date of Calibration* : Based on the annual calibration plan. At least 1 time per year.

Calibration Certificate

Certificate No.: 2502229-002-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Soi Udomsak 41, Sukhumvit Road,
Sangchuck, Prakhonong, Bangkok 10260

Page 1 of 3

Equipment: CHAMBER (Incubator)

Manufacturer: MEMMERT

Model: IPP260

Serial No.: V616.0066

ID No.: UAE.MIC.032/2559


Order No.: 2502229

Operation No.: 2502229-002

Date of Receipt: 19 March 2025

Date of Calibration: 19 March 2025

Calibrated by Mr.Yothin Charoensuk
Scientist

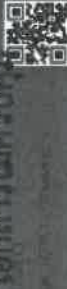
Approved by 
(Mr. Phoraphat Tuenjit) (for)
Manager, Division of Calibration Laboratory
Responsible for the Technical Management Team

Date of Issue: 25 March 2025

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

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

FCS-009 Revision: 01 Date: 20-04-65



Calibration Report

Certificate No.: 2502229-002-01
Equipment: CHAMBER (Incubator)
Model: JPP260 **Serial No.:** V616.0066
Resolution: 0.1 °C **ID No.:** UAE.MIC.032/2559
Manufacturer: MEMMERT
Date of Calibration: 19 March 2025

Page 2 of 3

Location: 302, UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.

Environment Condition: Ambient Temperature (21.7 ± 1) °C

Relative Humidity (59 ± 1) %

Line Voltage (223 ± 3) Volt

Condition of this results of Calibration:

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

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY57003188	TE 670486-01	8 June 2025	NATIONAL FOOD INSTITUTE
	RTD	CM201-558 RTD#201-209			

3. This certificate is traceable to International System of Units (SI Units).

4. This certificate was certified only for the instrument we calibrated.

5. This result of calibration was found accurate as shown on date and place of calibration only.

6. Condition of Calibrated item : Good

UUC Description :

Time of Record 1 Hour 9 Minute At 25.0 and 36.0 °C
Fresh air Damper ☒ Open Position ☐ Fan ☐
☒ Close ☐ Fan ☐
Not Available ☐ Without adjustment ☐ After adjustment

7. Result of Calibration : ☒ Without adjustment ☐ After adjustment


25 March 2025

FCS-012 Revision: 01 Date: 20-04-65



Calibration Report

Certificate No.: 2502229-002-01
Equipment: CHAMBER (Incubator)
Model: IP2160 **Serial No.:** V616.0066
Resolution: 0.1 °C **ID No.:** UAE.MIC.032/2559
Manufacturer: MEMMERT
Date of Calibration: 19 March 2025

Page 3 of 3



Calibration point: 25.0 and 36.0 °C

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (VAC)
MID	21.3	58	220.0
MAX	22.0	60	225.0

Table 1 : Reporting of Temperature

Calibration point (°C)	Measured Temperature (°C) @ Sensor No.									Uncertainty ± (°C)
	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	
25.0	25.19	25.16	25.22	25.17	24.85	24.91	24.78	24.85	24.97	0.29
36.0	34.57	34.74	35.13	35.29	36.32	36.16	36.20	36.34	35.73	0.63

Table 2 : Reporting of Characterization Result

UUC* Setting (°C)	UUC* Reading (°C)			Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
	MIN	MAX	Average			
25.0	24.9	25.0	25.0	0.088	0.25	0.61
36.0	35.9	36.0	36.0	0.44	1.2	2.3

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

UUC* = Unit Under Calibration

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

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

Overall Variation = The difference of the maximum and minimum measured temperatures throughout observation time.
The report uncertainty of measurement was based on standard uncertainty multiplied by coverage factor k= 2, providing a level of confidence of approximately 95 %.

----- End -----
P. Jeyapalan
25 March 2025



List of Instrument Certificates for Environmental Quality Analysis

No.	Instrument/Equipment	Parameter	Manufacturer	Model/Serial No.	Calibrator	Certification No.	Date of Calibration	Due date of Calibration*
1	Analytical Balance	TOTAL DISSOLVED SOLIDS	Mettler Toledo	XSR205DU / C210685394	National Food Institute,Ministry of Industry, Thailand	2502226-002-01	20/3/2025	19/3/2026
2	Incubator	ESCHERICHIA COLI TOTAL COLIFORM BACTERIA	Binder	KB400 / 202200000000391	National Food Institute Ministry of Industry, Thailand	2503287-002-01	5/6/2025	4/6/2026
3	Incubator	PSEUDOMONAS AERUGINOSA	MEMMERT	IF75 / D317.0305	National Food Institute, Ministry of Industry, Thailand	2502229-004-01	20/3/2025	19/3/2026

Due Date of Calibration* : Based on the annual calibration plan. At least 1 time per year.

Calibration Certificate

Certificate No.: 2503287-002-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.
Address: 3 Soi Udomsuk 41, Sukhumvit Road,
Bangchakdi, Prakhong, Bangkok 10260

Page 1 of 3

Equipment: CHAMBER (Incubator)

Manufacturer: BINDER

Model: KB 400

Serial No.: 20220000000391

ID No.: UAE.MIC.029/2565


Order No.: 2503287

Operation No.: 2503287-002

Date of Receipt: 5 June 2025

Date of Calibration: 5 June 2025

Calibrated by Mr. Phengphet Tanyit
Scientist

Approved by 
(Miss Phengphet Jaengkarnik)
Vice President, Department of Laboratory Services
Responsible for the Technical Management Team

Date of Issue: 11 June 2025

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

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

F-CS-009 Revision 01 Date: 20-04-65



Calibration Report

Certificate No.: 2503287-002-01
Equipment: CHAMBER (Incubator)
Model: KB 400 **Serial No.:** 20220000000391
Resolution: 0.1 °C **ID No.:** UAE.MIC.029/2565
Manufacturer: BINDER
Date of Calibration: 5 June 2025

Page 2 of 3

Location: Room 302 Microbiology Laboratory, UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.

Environment Condition:

Ambient Temperature (18 ± 1) °C
Relative Humidity (53 ± 6) %
Line Voltage (230 ± 5) Volt

Condition of this results of Calibration:

1. This instrument was calibrated by Insert 13 standard thermometer into its chamber and calibration according to W-T-E-014 based on TIAS G-20-1/02-08 (E); Guidelines for Calibration and Checks of "Temperature Controlled Enclosures".
 - The temperature scale used was based on ITS - 90.
 - All data show below were final values and the initial data may be obtained upon request.

2. Reference Standard Instrument:

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MT55003377	2501168-001-01	13 January 2026	NATIONAL FOOD INSTITUTE
	RTD	G1A101-203 / STD4 (0C-20)			

3. This certificate is traceable to International System of Units (SI Units).

4. This certificate was certified only for the instrument we calibrated.

5. This result of calibration was found accurate as shown on date and place of calibration only.

6. Condition of Calibrated item: Good

UUC Description:

Time of Record	1	Hour	9	Minute	At	35.0 °C
Fresh air Damper		Open		Position		
	X	Close		For	100%	
		Not Available				

7. Result of Calibration -

☒ Without adjustment

☐ After adjustment


11 June 2025

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



Calibration Report

Certificate No.: 2502229-004-01
Equipment: CHAMBER (Incubator)
Model: KB-400
Serial No.: 2022000000393
Resolution: 0.1 °C
ID No.: UAE.MIC.022/2565
Manufacturer: BINDER
Date of Calibration: 5 June 2025
Calibration point: 35.0 °C
Calibration result:

Calibration point: 35.0 °C				
Calibration result:				
Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (V _{eff})	
MIN	17.4	48	225.0	
MAX	18.5	59	235.0	

Table 1 : Reporting of Temperature														
Measured Temperature (°C) @ Sensor No. (Sensor No.13 is REF)														
Calibration point (°C)	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Uncertainty ± (°C)
35.0	35.08	35.11	35.01	35.13	35.17	35.09	34.98	34.89	35.15	35.05	35.86	34.89	35.86	0.27

Table 2 : Reporting of Characterization Result

UUC [±] Setting (°C)	UUC [±] Reading (°C)			Temperature Stability ± (°C)	Temperature Uniformity (°C)	Overall Variation (°C)
	MIN	MAX	Average			
35.0	35.0	35.1	35.0	0.036	0.17	0.34

Note: The stated uncertainty include "stability" and "Loading effect (20% of Temp Uniformity)"

UUC[±] = Unit Under Calibration

Stability = One-half of the greatest maximum difference of measured temperatures at any one sensor.

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

Overall variation = The difference of the maximum and minimum measured temperatures throughout observation time.

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

End

97 June 2025

NSC-TISI-17025 CALIBRATION 0081

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Calibration Certificate

Certificate No.: 2502229-004-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Address: 3 Sol Udomsuk 41, Sukhumvit Road,
Bangchack, Prakhong, Bangkok 10260

Page 1 of 3

Equipment: CHAMBER (Incubator)

Manufacturer: MEMMERT

Model: IN75

Serial No.: D317.0305

ID No.: UAE.MIC.022/2561

Order No.: 2502229

Operation No.: 2502229-004

Date of Receipt: 19 March 2025

Date of Calibration: 20 March 2025

Calibrated by: Mr.Yothin Charonsuk

Scientist

Approved by

(Mr.Pieraphat Tuantit) (for)

Manager, Division of Calibration Laboratory

Responsible for the Technical Management Team

Date of Issue: 25 March 2025

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

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

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Calibration Report

Certificate No.: 2502229-004-01
Equipment: CHAMBER (Incubator)
Model: IN75
Serial No.: D317 0305
Resolution: 0.1 °C
ID No.: UAE-MTC-022/2561
Manufacturer: MENMERT
Date of Calibration: 20 March 2025
Page 2 of 3

Location: 302, UNITED ANALYST AND ENGINEERING CONSULTANT CO.,LTD.
Environment Condition:
Ambient Temperature (28.8 ± 1) °C
Relative Humidity (59 ± 1) %
Line Voltage (223 ± 3) Volt

Condition of this results of Calibration:

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

Instrument	Model	Serial No./ID No.	Certificate No.	Due Date	Through
Digital Thermometer with sensor	34972A	MY570031188	TE 670486-01	8 June 2025	NATIONAL FOOD INSTITUTE
	RTD	CH-101-109-R104-101-109			

3. This certificate is traceable to International System of Units (SI Units).

4. This certificate was certified only for the instrument we calibrated.

5. This result of calibration was found accurate as shown on date and place of calibration only.

6. Condition of Calibrated Item : Good

UUC Description :

Time of Record 1 Hour 9 Minute At 41.5 °C
Fresh air Damper ☒ Open ☐ Close ☐ Fan ☐ Stop
Not Available ☐ Without adjustment ☐ After adjustment ☐

7. Result of Calibration :

S. Jangphak
25 March 2025

Calibration Report

Certificate No.: 2502229-004-01
Equipment: CHAMBER (Incubator)
Model: IN75
Serial No.: D317 0305
Resolution: 0.1 °C
ID No.: UAE-MTC-022/2561
Manufacturer: MENMERT
Date of Calibration: 20 March 2025
Page 3 of 3

Calibration point: 41.5 °C

Calibration result:

Calibration Condition	Temperature (°C)	Relative Humidity (%)	Line Voltage (Volt)
MIN	28.6	58	220.0
MAX	28.9	60	225.0

Table 1 : Reporting of Temperature

Calibration point (°C)	Measured Temperature (°C) @ Sensor No.									Uncertainty ± (°C)
	(Sensor No.9 is REF)									
41.5	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	
	41.50	41.39	41.45	41.40	41.69	41.35	41.29	41.32	41.34	0.27

Table 2 : Reporting of Characterization Result

UUC Setting (°C)	UUC Reading (°C)		Stability ± (°C)	Uniformity (°C)	Overall Variation (°C)
	MIN	MAX			
41.5	41.5	41.5	0.023	0.34	0.44

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

UUC = Unit Under Calibration

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

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

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

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

----- End -----

S. Jangphak
25 March 2025

Calibration Certificate

Certificate No.: 2502226-002-01
Client name: UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.
Address: 3 Soi Udomsak 41, Sukhumvit Road,
Bangchack, Prakhong, Bangkok 10260

Page 1 of 4

Equipment: Electronic Balance

Manufacturer: METTLER TOLEDO

Model: XSR2050U

Serial No.: C210685394

ID No.: UAE.WAO.010/2565

Order No.: 2502226

Operation No.: 2502226-002

Date of Receipt: 19 March 2025

Date of Calibration: 20 March 2025

Calibrated by Mr. Yothin Charoensuk

Scientist

Approved by Mr. N. Ningsubol

(Mr. Phraphat Tuanjit)

Manager, Division of Calibration Laboratory

Responsible for the Technical Management Team

Date of Issue: 25 March 2025

The uncertainties are for a confidence probability of approximately 95%

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

ISO 17025 Revision: 01 Date: 30.04.65

Calibration Report

Certificate No.: 2502226-002-01
Equipment: Electronic Balance
Model: XSR2050U
Serial No.: C210685394
Capacity: 52 g / 220 g
Manufacturer: METTLER TOLEDO
Resolution: 0.00001 g / 0.0001 g
ID No.: UAE.WAO.010/2565

Page 2 of 4

Date of Calibration: 20 March 2025
Environment Condition: Ambient Temperature: 21.2 ± 0.5 °C Relative Humidity: 48 ± 3.5 %

Place of Calibration: 208 Balance Room, UNITED ANALYST AND ENGINEERING CONSULTANT CO., LTD.

Condition of Equipment: Good Condition

Condition of This Results of Calibration:

1. Calibration Method: NFI Method W-M4-001 In-House Method based on UKAS Lab 14 2019

2. Reference Standards:

Reference Standard **Model** **Serial No.** **Calibrated By** **Certificate No.** **Due Date**
Standard Weight Class E2 1mg to 200mg B-05587572 TCS M24041005 19 April 2025

Instrument **Model** **Serial No.** **Calibrated By** **Certificate No.** **Due Date**
Thermo-Hygro Meter 608-H3 NFI.BTH.017753 Quality Return QR33-0542 10 February 2026

3. This certification is traceable to SI UNIT

4. This certificate was certified only for the instrument we calibrated

5. This result of calibration was found accurate as shown on date and place of calibration only

Calibration Results:

1. Repeatability of Reading:

Nominal Value (g)	Standard Deviation of Reading (g)
40	0.000042
80	0.000042
100	0.000000
200	0.000000

2. Off-Center Error:

A mass of 100 g was placed and moved to various position on pan.

The balance reading obtained is given in the table.

1	2	3	4	5	6	(Maximum Difference)
(g)	(g)	(g)	(g)	(g)	(g)	(g)
100.0001	100.0002	100.0001	100.0001	100.0001	100.0001	0.0000

to N. Ningsubol

ISO 17025 Revision: 01 Date: 30.04.65



Calibration Report

Certificate No.: 25022226-002-01
Equipment: Electronic Balance
Model: XSR20SDU
Serial No.: C210685394
Capacity: 82 g / 220 g

Manufacturer: METTLER TOLEDO
Resolution: 0.0001 g / 0.0001 g
ID No.: UWE-WHO-010/2565

Page 3 of 4

Date of Calibration: 20 March 2025

Calibration Results: (Continued)

Calibration Range: 0-80 g

Calibration Adjustment: Internal Calibration

3. Departure from Nominal Value: (Range: 0 - 82 g ; Resolution: 0.00001 g)

Nominal Value (g)	Standard Value (g)	Average Reading (g)	Correction (g)	Uncertainty (± g)	Coverage Factor k
Unloaded	0.00000	0.00000	0.00000	0.0000087	2.00
0.021	0.001003	0.00100	0.00000	0.0000090	2.00
0.005	0.005002	0.00501	-0.00001	0.0000092	2.00
0.01	0.010003	0.01002	-0.00002	0.0000093	2.00
0.05	0.049996	0.05001	-0.00001	0.0000096	2.00
0.1	0.100011	0.10002	-0.00001	0.000011	2.00
0.5	0.500016	0.50004	-0.00002	0.000014	2.00
1	1.000003	1.00005	-0.00005	0.000016	2.00
2	2.000023	2.00006	-0.00004	0.000017	2.00
5	5.000015	5.00006	-0.00005	0.000020	2.00
10	10.000009	10.00005	-0.00004	0.000026	2.00
20	20.000030	20.00007	-0.00004	0.000037	2.00
30	30.000039	30.00009	-0.00005	0.000050	2.00
50	50.000038	50.00009	-0.00005	0.000069	2.00
80	80.000067	80.00013	-0.00006	0.00011	2.00

for N. Nigro



Calibration Report

Certificate No.: 25022226-002-01
Equipment: Electronic Balance
Model: XSR20SDU
Serial No.: C210685394
Capacity: 82 g / 220 g

Manufacturer: METTLER TOLEDO
Resolution: 0.00001 g / 0.0001 g
ID No.: UWE-WHO-010/2565

Page 4 of 4

Date of Calibration: 20 March 2025

Calibration Results: (Continued)

Calibration Range: >80-200 g

Calibration Adjustment: Internal Calibration

3. Departure from Nominal Value: (Range: >80 - 200 g ; Resolution: 0.00001 g)

Nominal Value (g)	Standard Value (g)	Average Reading (g)	Correction (g)	Uncertainty (± g)	Coverage Factor k
90	90.00010	90.0002	-0.0001	0.00015	2.00
100	100.00006	100.0001	0.0000	0.00016	2.00
110	110.00007	110.0002	-0.0001	0.00017	2.00
120	120.00009	120.0002	-0.0001	0.00018	2.00
130	130.00010	130.0002	-0.0001	0.00019	2.00
140	140.00013	140.0002	-0.0001	0.00019	2.00
150	150.00009	150.0002	-0.0001	0.00021	2.00
160	160.00010	160.0002	-0.0001	0.00022	2.00
170	170.00012	170.0002	-0.0001	0.00023	2.00
200	200.00013	200.0002	-0.0001	0.00028	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 %.

***** End *****

for N. Nigro

