

ภาคผนวกที่ 4

สรุปเอกสารการสอบเทียบอุปกรณ์เครื่องมือ

การสอบเทียบเครื่องมือหลักที่ใช้ในการตรวจวัดตามมาตรฐานตรวจสอบคุณภาพสิ่งแวดล้อม (กรกฎาคม-ธันวาคม 2567)

ชนิดของมลพิษ	รายการทดสอบ	วิธีทดสอบ	เครื่องมือ	รุ่น	หมายเลขเครื่องมือ	ความถี่ในการสอบเทียบ	การสอบเทียบครั้งล่าสุด	ผลการสอบเทียบ
คุณภาพน้ำ (Water)	1. M-Alkalinity	- Titration	1. Analytical Balance	XS205DU	1126323724	1 ครั้ง / ปี (EC)	9 ธ.ค. 67	PASS
	2. Ammonia	- Distillation and Titrimetric	2. Hot air oven	UF110	B418.1243	1 ครั้ง / ปี (EC)	19 ธ.ค. 67	PASS
	3. BOD ₅	- 5-Day BOD Test, Membrane Electrode	3. Standard Weight	Class F1	-	1 ครั้ง / 3 ปี (EC)	3 มิ.ย. 67	PASS
	4. Calcium hardness	- EDTA Titrimetric Method						
	5. Chloride	- Argentometric						
	6. Chlorine (Residual)	- DPD Colorimetric Method (SM:4500-Cl-G)						
	7. Chlorine (Combined)	- Calculation						
	8. COD	- Open Reflux, Titrimetric						
	9. Total Dissolved Solids	- Dried at 103-105 °C						
	10. Grease & Oil	- Partition Gravimetric						
	11. Total Suspended Solids	- Dried at 103-105 °C						
	12. Settleable Solid	- Volumetric Method						
	12. Sulfide	- ZnS Precipitation, Iodometric Method						
	13. Total Kjeldahl Nitrogen	- Nephelometric						
	14. Fecal Coliform Bacteria	- MPN Test	1. Analytical Balance	XS205DU	B344940005	1 ครั้ง / ปี (EC)	9 ธ.ค. 67	PASS
	15. Coliform Bacteria		2. Hot air oven	UF110	B418.1243	1 ครั้ง / ปี (EC)	19 ธ.ค. 67	PASS
	16. E.Coli							
	17. Nitrate Nitrogen	- Cadmium Reduction	1. Spectrophotometer	UV-1800	A11635101643	1 ครั้ง / ปี (EC)	22 เม.ย. 67	PASS
	18. Sulfide	- Distillation, Colorimetric	2. Analytical Balance	XS205DU	B344940005	1 ครั้ง / ปี (EC)	9 ธ.ค. 67	PASS
	19. Flow rate	- Calculation	-	-	-	-	-	-
	20. pH	- Electrometric	1. pH Meter	SevenCompact S220	B835349235	1 ครั้ง / ปี (EC)	5 ก.พ. 67	PASS

การสอบเทียบเครื่องมือหลักที่ใช้ในการตรวจวัดตามมาตรฐานการติดตามตรวจสอบคุณภาพสิ่งแวดล้อม (กรกฎาคม-ธันวาคม 2567)

ชนิดของมลพิษ	รายการทดสอบ	วิธีทดสอบ	เครื่องมือ	รุ่น	หมายเลขเครื่องมือ	ความถี่ในการสอบเทียบ	การสอบเทียบครั้งล่าสุด	ผลการสอบเทียบ
คุณภาพน้ำ (Water) (ต่อ)	21. Cyanuric acid	Turbidimetric Method	-	-	-	-	-	-
	22. <i>Pseudomonas aeruginosa</i>	ISO16266:2006	-	-	-	-	-	-
	23. <i>Staphylococcus aureus</i>	AWWA (2017) (SM:9213 B)	-	-	-	-	-	-

Remark

EC = External Calibration (สอบเทียบ โดย หน่วยงานภายนอก)

IC = Internal Calibration (สอบเทียบ โดย หน่วยงานภายใน)

ES = External Service (บำรุงรักษา โดย หน่วยงานภายนอก)

พารามิเตอร์อื่นที่ไม่ได้กล่าวถึงบางพารามิเตอร์เป็นงานทดสอบพื้นฐานที่ใช้อุปกรณ์เครื่องแก้วและ/หรือมีการสอบเทียบภายในก่อนการใช้งานในขั้นตอนการทำงานเป็นการเฉพาะ

ภาคผนวกที่ 5

เอกสาร Detection Limit ของรายการทดสอบ

Rev.3 วันที่ 21/6/2024 แก้ไข Detection Limit ของโลหะหนักโดยรายงานหน่วย mg/m3 ทุกพารามิเตอร์เพื่อให้สอดคล้อง กับมาตรฐาน

การตรวจวิเคราะห์คุณภาพอากาศ (Air Quality Analysis)

ประเภทตัวอย่าง : อากาศในบริเวณการทำงาน - Workplace Air Quality)									
Items	Parameter	Sampling/Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
	แผนปฏิบัติการภาคสนาม								
1	Illumination	Lux Meter	JIS C 1906 / Lux meter		-	0-5000	lux	-	
2	Sound (Leq, Lmin, Lmax, Ldn, Lp)	Integrated Sound Level Method	ISO 11202 / Sound Level Meter		-	40 - 140	dB (A)	1	
3	Noise Octave band	Integrated Sound Level Method	AS/NZS 4476 1997 / Sound Level Meter		-	40 – 140	dB (A)	1	1/3 Octave band หรือ 1/1 Octave band
4	Noise dose	Integrated Sound Level Method	BS6402 / Noise Dosemeter		-	0 - 9999	% Dose	2	
5	Carbon Monoxide (CO)	Non-Dispersive Infrared Photometric Method	U.S. EPA 10 (P.1-5)/ Carbon Monoxide Analyzer		-	0.1 - 100	ppm	1	
6	Ozone (O ₃)	UV Fluorescence Method	U.S. EPA method / Ozone Analyzer		-	0.1 - 100	ppm	2	
7	Heat Stress	WBGT Method	ACGIH / Grove + DI + Thermometer / calculation	-	-	0 - 100	oC	2	
	ส่วนงานทดสอบพื้นฐาน								
1	Total Dust (TD)	Filtration, Gravimetric Method	NIOSH 0500 (P.1-3) / PS pump / Gravimetric	7-133 L	2 L/min (1 hr)	0.8	mg / m ³	1	SKC Cat No. 225-8-01
2	Respirable Dust (RD)	Cyclone - Filtration, Gravimetric Method	NIOSH 0600 (P.1-3) / PS pump cyclone / Gravimetric	20-400 L	1.70 L/min (1 hr)	0.5	mg / m ³	1	SKC Cat No. 225-8-01
3	NaOH	Acid-Base Titrimetric Method	NIOSH 7401(P.1-4) / PS pump / Titration	70-1000 L	1-4 L/min	0.4	mg / m ³	1	SKC Cat No. 225-17-01
4	KOH	Acid-Base Titrimetric Method	NIOSH 7401(P.1-4) / PS pump / Titration	70-1000 L	1-4 L/min	0.6	mg / m ³	1	SKC Cat No. 225-17-01
5	LiOH	Acid-Base Titrimetric Method	NIOSH 7401(P.1-4) / PS pump / Titration	70-1000 L	1-4 L/min	0.2	mg / m ³	1	SKC Cat No. 225-17-01
	ส่วนงานเครื่องมือทดสอบ								
1	Ammonia	Impingement Absorption - Colorimetric Method	Modified NIOSH 6015(P.1-7) / Spectrophotometer	0.1-96 L	1 L/min (1 hr)	0.01	mg / m ³	2	
2	Nitrogen Dioxide	Impingement Absorption, Spectrophotometer Method	APHA 817(P.1-3) / Spectrophotometer	7.5 – 10 L	0.5 L/min (15-20 min)	0.01	ppm	2	
3	Sulfur Dioxide	Impingement Absorption, Titrimetric Method	APHA 823(P.1-3) / Titration	26 L	0.21 L/min (2 hrs)	0.30 0.11	mg / m ³ ppm	2	
4	P,P'-diphenylmethane (MDI)	Impingement Absorption, Spectrophotometer Method	APHA 831(P.1-3) / Spectrophotometer	20 L	1 L/min (20 min)	0.002	ppm	2	
5	Aluminum (Al)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-100 L	2 L/min (1 hr)	0.004	mg / m ³	3	SKC Cat No. 225-5

Items	Parameter	Sampling/Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
6	Antimony (Sb)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	50-2000 L	2 L/min (1 hr)	0.021	mg / m ³	3	SKC Cat No. 225-5
7	Arsenic & Compound (as As)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-2000 L	2 L/min (1 hr)	0.010	mg / m ³	3	SKC Cat No. 225-5
8	Barium (Ba)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	50-2000 L	2 L/min (1 hr)	0.004	mg / m ³	3	SKC Cat No. 225-5
9	Cadmium & Compounds (as Cd)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	25-1500 L	2 L/min (1 hr)	0.004	mg / m ³	3	SKC Cat No. 225-5
10	Calcium & Compounds (as Ca)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	20-400 L	2 L/min (1 hr)	0.208	mg / m ³	3	SKC Cat No. 225-5
11	Chromium & Compounds (as Cr)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-1000 L	2 L/min (1 hr)	0.004	mg / m ³	3	SKC Cat No. 225-5
12	Copper (Cu) (Dust & Fume)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	50-1500 L	2 L/min (1 hr)	0.004	mg / m ³	3	SKC Cat No. 225-5
13	Iron & Compounds (as Fe)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-1000 L	2 L/min (1 hr)	0.004	mg / m ³	3	SKC Cat No. 225-5
14	Lead (Pb)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	50-2000 L	2 L/min (1 hr)	0.004	mg / m ³	3	SKC Cat No. 225-5
15	Magnesium (Mg)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	6-67 L	2 L/min (1 hr)	0.208	mg / m ³	3	SKC Cat No. 225-5
16	Manganese (Mn)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-200 L	2 L/min (1 hr)	0.004	mg / m ³	3	SKC Cat No. 225-5
17	Mercury (Hg)	Filtration - AAS Method	NIOSH 6009(P.1-5) / PS pump / AAS	2 – 100 L	0.2 L/min (1 hr)	0.00002	mg / m ³	5	SKC Cat No. 225-5
18	Nickel & Compounds (as Ni)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-1000 L	2 L/min (1 hr)	0.004	mg / m ³	3	SKC Cat No. 225-5
19	Selenium (Se)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	13-2000 L	2 L/min (1 hr)	0.021	mg / m ³	3	SKC Cat No. 225-5
20	Silver (Ag)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	250-2000 L	2 L/min (2-17 hr)	0.010	mg / m ³	3	SKC Cat No. 225-5
21	Sodium (Na)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	13-2000 L	2 L/min (1 hr)	0.208	mg / m ³	3	SKC Cat No. 225-5
22	Tin (Sn)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-1000 L	2 L/min (1 hr)	0.021	mg / m ³	3	SKC Cat No. 225-5

Items	Parameter	Sampling/Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
23	Titanium (Ti)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-1000 L	2 L/min (1 hr)	0.004	mg / m ³	3	SKC Cat No. 225-5
24	Vanadium (V)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-2000 L	2 L/min (1 hr)	0.004	mg / m ³	3	SKC Cat No. 225-5
25	Zinc & Compounds (Zn)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-2000 L	2 L/min (1 hr)	0.004	mg / m ³	3	SKC Cat No. 225-5
26	Acetone	Sorbent Adsorption, GC Method	NIOSH 1300 (P.1-5) / PS pump / GC-FID	0.5-3 L	0.10 L/min (30 min)	13.17 5.54	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
27	Benzene	Sorbent Adsorption, GC Method	NIOSH 1501(P.1-7) / PS pump / GC-FID	5-30 L	0.10 L/min (1 hr)	2.93 0.92	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
28	Cyclohexanone	Sorbent Adsorption, GC Method	NIOSH 1300(P.1-5) / PS pump / GC-FID	1-10 L	0.10 L/min (1 hr)	3.96 0.99	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
29	Ethanol (Ethyl alcohol)	Sorbent Adsorption, GC Method	NIOSH 1400(P.1-4) / PS pump / GC-FID	12 L	0.10 L/min (1 hr)	3.29 1.75	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
30	Ethylacetate	Sorbent Adsorption, GC Method	NIOSH 1457 (P.1-4) / PS pump / GC-FID	0.1-10 L	0.10 L/min (1 hr)	7.21 2.00	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
31	Ethylbenzene	Sorbent Adsorption, GC Method	NIOSH 1501 (P.1-7) / PS pump / GC-FID	1-24 L	0.10 L/min (1 hr)	3.63 0.83	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
32	Hexane	Sorbent Adsorption, GC Method	NIOSH 1500(P.1-8) / PS pump / GC-FID	4 L	0.10 L/min (1 hr)	7.05 2.00	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
33	Isopropanol (Isopropyl alcohol) ; IPA	Sorbent Adsorption, GC Method	NIOSH 1400(P.1-4) / PS pump / GC-FID	12 L	0.10 L/min (1 hr)	3.28 1.33	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
34	Methanol (Methyl alcohol)	Sorbent Adsorption, GC Method	OSHA 91(P.1-10) / PS pump / GC-FID	1-5 L	0.10 L/min (30 min)	3.96 3.02	mg / m ³ ppm	2	SKC Cat. No. ST 226-82
35	Methyl Ethyl Ketone (MEK)	Sorbent Adsorption, GC Method	OSHA 1004(P.1-27) / PS pump / GC-FID	0.25-12L	0.10 L/min (1 hr)	3.35 1.14	mg / m ³ ppm	2	SKC Cat. No. ST 226-81A
36	Methyl Isobutyl Ketone (MIBK)	Sorbent Adsorption, GC Method	OSHA 1004(P.1-27) / PS pump / GC-FID	0.25-12L	0.10 L/min (1 hr)	3.34 0.81	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
37	Styrene	Sorbent Adsorption, GC Method	NIOSH 1501 (P.1-7) / PS pump / GC-FID	1-24 L	0.10 L/min (1 hr)	3.78 0.89	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
38	Toluene	Sorbent Adsorption, GC Method	NIOSH 1501 (P.1-7) / PS pump / GC-FID	1-8 L	0.10 L/min (1 hr)	3.63 0.96	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
39	Xylene	Sorbent Adsorption, GC Method	NIOSH 1501 (P.1-7) / PS pump / GC-FID	2-23 L	0.10 L/min (1 hr)	3.58 0.83	mg / m ³ ppm	2	SKC Cat. No. ST 226-01

Items	Parameter	Sampling/Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
40	Cumene	Sorbent Adsorption, GC Method	NIOSH 1501 (P.1-7) / PS pump / GC-FID	2-23 L	0.10 L/min (1 hr)	3.60 0.73	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
41	Methylcyclohexane	Sorbent Adsorption, GC Method	NIOSH 1500 (P.1-8) / PS pump / GC-FID	2-23 L	0.10 L/min (1 hr)	7.23 1.80	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
42	Methyl acetate	Sorbent Adsorption, GC Method	NIOSH 1458 (P.1-8) / PS pump / GC-FID	0.2-10 L	0.10 L/min (1 hr)	9.09 3.00	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
43	Diethyl Ether or Ethyl Ether	Sorbent Adsorption, GC Method	NIOSH 1610 (P.1-4) / PS pump / GC-FID	0.25-3 L	0.01-0.20 L/min (1 hr)	11.88 3.92	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
44	Methyl tert-Butyl Ether (MTBE)	Sorbent Adsorption, GC Method	NIOSH 1615 (P.1-4) / PS pump / GC-FID	2-96 L	0.01-0.20 L/min (1 hr)	3.08 0.86	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
45	Dichloromethane or Methylene chloride	Sorbent Adsorption, GC Method	NIOSH 1005 (P.1-4) / PS pump / GC-FID	0.5-2.5 L	0.01-0.20 L/min (1 hr)	22.1 6.36	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
46	1-Butanol /n-butyl alcohol	Sorbent Adsorption, GC Method	NIOSH 1401 (P.1-4) / PS pump / GC-FID	2-10 L	0.01-0.20 L/min (1 hr)	4.86 1.60	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
47	2-Butanol /sec-butyl alcohol	Sorbent Adsorption, GC Method	NIOSH 1401 (P.1-4) / PS pump / GC-FID	2-10 L	0.01-0.20 L/min (1 hr)	4.86 1.60	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
48	Isobutyl alcohol (IBA)	Sorbent Adsorption, GC Method	NIOSH 1401 (P.1-4) / PS pump / GC-FID	2-10 L	0.01-0.20 L/min (1 hr)	4.81 1.59	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
49	Beryllium (Be)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	1250-2000 L	2 L/min (1 hr)	0.004	mg / m ³	3	SKC Cat No. 225-5
50	Cobalt (Co)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	25-2000 L	2 L/min (1 hr)	0.004	mg / m ³	3	SKC Cat No. 225-5
51	Molybdenum (Mo)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-67 L	2 L/min (1 hr)	0.004	mg / m ³	3	SKC Cat No. 225-5
52	Thallium (Tl)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	25-2000 L	2 L/min (1 hr)	0.021	mg / m ³	3	SKC Cat No. 225-5
53	Silicon (Si)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-1000 L	2 L/min (1 hr)	0.010	mg / m ³	3	SKC Cat No. 225-5
54	Potassium (K)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-1000 L	2 L/min (1 hr)	0.208	mg / m ³	3	SKC Cat No. 225-5
55	Ketones	Sorbent Adsorption, GC Method	NIOSH 2555 (P.1-5) / PS pump / GC-FID	0.5-3.0 L	0.01-0.20 L/min (1 hr)	13.17 5.54	mg / m ³ ppm	2	SKC Cat. No. 226-01
56	n-Heptane	Sorbent Adsorption, GC Method	NIOSH 1500 (P.1-8) / PS pump / GC-FID	-	0.01-0.20 L/min (1 hr)	6.97 1.70	mg / m ³ ppm	2	SKC Cat. No. 226-01

Items	Parameter	Sampling/Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
57	n-Butyl acetate	Sorbent Adsorption, GC Method	NIOSH 1450(P.1-6) / PS pump / GC-FID	1-10 L	0.01-0.20 L/min (1 hr)	8.55 1.80	mg / m ³ ppm	2	SKC Cat. No. 226-01
58	n-Pentane	Sorbent Adsorption, GC Method	NIOSH 1500(P.1-8) / PS pump / GC-FID	-	0.01-0.20 L/min (1 hr)	2.63 0.89	mg / m ³ ppm	2	SKC Cat. No. 226-01
59	Chloroform	Sorbent Adsorption, GC Method	NIOSH 1003 (P.1-7) / PS pump / GC-FID	1-50 L	0.01-0.20 L/min (1 hr)	4.93 1.01	mg / m ³ ppm	2	SKC Cat. No. 226-01
60	Chlorobenzene	Sorbent Adsorption, GC Method	NIOSH 1003 (P.1-7) / PS pump / GC-FID	1.5-40L	0.01-0.20 L/min (1 hr)	4.63 1.00	mg / m ³ ppm	2	SKC Cat. No. 226-01
61	Formaldehyde	Sorbent Adsorption, GC Method	NIOSH 2541 (P.1-5) / PS pump / GC-FID	1-36L	0.01-0.10 L/min (1 hr)	0.12 0.10	mg / m ³ ppm	2	SKC Cat. No. 226-118 เปลี่ยน DL:1/2/24
62	Hydrogen chloride	Sorbent Adsorption, IC Method	OSHA ID-174SG / PS pump / IC	100 L	0.5 L/min (15 min)	0.015 0.010	mg / m ³ ppm	3	SKC Cat. No. 226-10-03
63	Hydrogen Bromide	Sorbent Adsorption, IC Method	OSHA ID165SG / PS pump / IC	96 L	0.2 L/min (60min)	0.033 0.010	mg / m ³ ppm	3	SKC Cat. No. 226-10-03
64	Sulfuric Acid	Sorbent Adsorption, IC Method	OSHA ID165SG / PS pump / IC	96 L	0.2 L/min (60min)	0.040 0.010	mg / m ³ ppm	3	SKC Cat. No. 226-10-03
65	Phosphoric Acid	Sorbent Adsorption, IC Method	OSHA ID165SG / PS pump / IC	96 L	0.2 L/min (60min)	0.040 0.010	mg / m ³ ppm	3	SKC Cat. No. 226-10-03
66	Ammonia (NH ₃)	Sorbent Adsorption, IC Method	NIOSH 6016 / PS pump / IC	0.10 - 96 L	0.2 L/min (120min)	0.200 0.280	mg / m ³ ppm	3	SKC Cat. No. 226-10-06
67	Nitric	Sorbent Adsorption, IC Method	OSHA ID165SG / PS pump / IC	96 L	0.2 L/min (60min)	0.026 0.010	mg / m ³ ppm	3	SKC Cat. No. 226-10-03
68	Chlorine	Sorbent Adsorption, IC Method	OSHA ID-202 / PS pump / IC	60 L	0.5 L/min (60min)	0.029 0.010	mg / m ³ ppm	3	0.02% KI in Buffer
69	Hydrogen fluoride	Sorbent Adsorption, IC Method	OSHA ID165SG / PS pump / IC	96 L	0.2 L/min (60min)	0.008 0.010	mg / m ³ ppm	3	SKC Cat. No. 226-10-03
70	Phosphorus (P)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-1000 L	2 L/min (1 hr)	0.042	mg / m ³	3	SKC Cat No. 225-5
71	Boron (B)	Filtration, ICP-OES Method	NIOSH 7300(P.1-8) / PS pump / ICP-OES	5-1000 L	2 L/min (1 hr)	0.010	mg / m ³	3	SKC Cat No. 225-5
72	Sulfur dioxide	Filtration, IC Method	NIOSH 6004 / PS pump / IC	4-200 L	1 L/min (120min)	0.015 0.006	mg / m ³ ppm	3	Treated Filter
73	Sulfuric Acid	Filtration, IC Method	NIOSH 7908 / PS pump / IC	15-2000 L	1 L/min (120min)	0.040 0.010	mg / m ³ ppm	3	Fiter (PTFE)

Items	Parameter	Sampling/Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
74	Phosphoric Acid	Filtration, IC Method	NIOSH 7908 / PS pump / IC	15-2000 L	1 L/min (120min)	0.040 0.010	mg / m ³ ppm	3	Fiter (PTFE)

เอกสารอ้างอิง

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การตรวจวิเคราะห์คุณภาพอากาศ (Air Quality Analysis)

(ประเภทตัวอย่าง : อากาศในบรรยากาศโดยทั่วไป - Ambient Air Quality)									
Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
แผนปฏิบัติการภาคสนาม									
1	Sulfur Dioxide (SO ₂)	UV Fluorescence Method	U.S. EPA EQSA-0292-084 / Sulfur Dioxide Analyzer	-	24 hrs (1 hr avg.)	0.001 - 10	ppm	3	
2	Nitrogen Dioxide (NO ₂)	Chemiluminescence Method	U.S. EPA RFCA-0995-108 / Nitrogen Dioxide Analyzer	-	24 hrs (1 hr avg.)	0.001 - 10	ppm	3	
3	Carbon Monoxide (CO)	Non-Dispersive Infrared Photometric Method	U.S. EPA 40 CFR Part 50 Appendix C / Carbon Monoxide	-	24 hrs (8 hr avg.)	0.1 - 100	ppm	1	
4	Ozone (O ₃)	UV Fluorescence Method	U.S. EPA 40 CFR Part 50 Appendix D / Ozone Analyzer	-	24 hrs (1 hr avg.)	0.001 - 10	ppm	3	
5	Sound (Leq, Lmin, Lmax, Ldn, Lp)	Integrated Sound Level Method	ISO 1996-1 / Sound Level meter	-	24 hrs (1 hr avg.)	40 - 140	dB (A)	1	
6	Wind Speed & Wind Direction	Wind Speed & Wind Direction Sensor	ASTM D 4480-93 / WS/WD Equipment	-	-	-	-	-	Wind speed & Wind
ส่วนงานทดสอบพื้นฐาน									
1	Total Particulate Matter (TSP)	Gravimetric Method	U.S. EPA Method Part 50 / Gravimetric Method	-	-	-	mg / m ³ ppm	2	
2	PM10	Gravimetric Method	U.S. EPA Method Part 50 / Gravimetric Method	-	-	-	mg / m ³ ppm	2	
3	PM2.5	Gravimetric Method	U.S. EPA Method Part 50 / Gravimetric Method	-	-	200	mg / m ³	-	
ส่วนงานเครื่องมือทดสอบ									
1	Ammonia (NH ₃)	Impingement Absorption, Colorimetric Method	APHA 401 / Spectrophotometer	288 L	0.2 L/min (24 hrs)	0.01	mg / m ³	2	
2	Sulfur Dioxide (SO ₂)	Pararosanine Method	U.S. EPA 40 CFR Part 50 Appendix A / Spectrophotometer	288 L	0.2 L/min (24 hrs)	0.01	mg / m3	2	

Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
3	Aluminium (Al)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
4	Antimony (Sb)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
5	Arsenic (As)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
6	Barium (Ba)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
7	Cadmium (Cd)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
8	Calcium (Ca)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
9	Chromium (Cr)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
10	Copper (Cu)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
11	Iron (Fe)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
12	Lead (Pb)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
13	Magnesium (Mg)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
14	Manganese (Mn)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
15	Mercury (Hg)	Filtration, AAS Method	U.S. EPA Method IO-3.4 / High Volume - AAS	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
16	Nickel (Ni)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
17	Potassium (K)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
18	Sodium (Na)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
19	Tin (Sn)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
20	Titanium (Ti)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "

Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
21	Vanadium (V)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
22	Zinc (Zn)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
23	Selenium (Se)	Filtration, ICP-OES Method	U.S. EPA Method IO-3.4 / High Volume - ICP-OES	1,590 – 2,447 m ³	39-60 ft ³ /min (24 hrs)	0.0001	mg / m ³	4	Advantage MFS Cat. No. GA55 8 x 10 "
24	Acetone	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.14 0.06	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
25	Benzene	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.12 0.04	mg / m ³ ppm	2	SKC Cat. No. ST 226-02
26	Cyclohexanone	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.16 0.04	mg / m ³ ppm	2	SKC Cat. No. ST 226-04
27	Ethanol (Ethyl alcohol)	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	288 L	0.10 L/min (24 hrs)	0.14 0.07	mg / m ³ ppm	2	SKC Cat. No. ST 226-05
28	Ethylacetate	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.32 0.09	mg / m ³ ppm	2	SKC Cat. No. ST 226-06
29	Ethylbenzene	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.15 0.03	mg / m ³ ppm	2	SKC Cat. No. ST 226-07
30	Hexane	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.32 0.09	mg / m ³ ppm	2	SKC Cat. No. ST 226-08
31	Isopropanol (Isopropyl alcohol) ; IPA	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	288 L	0.10 L/min (24 hrs)	0.14 0.06	mg / m ³ ppm	2	SKC Cat. No. ST 226-09
32	Methanol (Methyl alcohol)	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.07 0.05	mg / m ³ ppm	2	SKC Cat. No. ST 226-10
33	Methyl Ethyl Ketone (MEK)	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.14 0.05	mg / m ³ ppm	2	SKC Cat. No. ST 226-11
34	Styrene	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.16 0.04	mg / m ³ ppm	2	SKC Cat. No. ST 226-12
35	Toluene	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.15 0.04	mg / m ³ ppm	2	SKC Cat. No. ST 226-13
36	Xylene	Sorbent Adsorption, GC Method	ASTM D 3687-95 / GC-FID	144 L	0.10 L/min (24 hrs)	0.15 0.03	mg / m ³ ppm	2	SKC Cat. No. ST 226-14
37	Methylcyclohexane	Sorbent Adsorption, GC Method	NIOSH 1500 (P.1-8) / PS pump / GC-FID	2-23 L	0.10 L/min (1 hr)	0.32 0.08	mg / m ³ ppm	2	SKC Cat. No. ST 226-01

Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
38	Methyl acetate	Sorbent Adsorption, GC Method	NIOSH 1458 (P.1-8) / PS pump / GC-FID	0.2-10 L	0.10 L/min (1 hr)	0.61 0.20	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
39	Diethyl Ether or Ethyl Ether	Sorbent Adsorption, GC Method	NIOSH 1610 (P.1-4) / PS pump / GC-FID	0.25-3 L	0.01-0.20 L/min (1 hr)	0.12 0.04	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
40	Methyl tert-Butyl Ether (MTBE)	Sorbent Adsorption, GC Method	NIOSH 1615 (P.1-4) / PS pump / GC-FID	2-96 L	0.01-0.20 L/min (1 hr)	0.13 0.04	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
41	Dichloromethane	Sorbent Adsorption, GC Method	NIOSH 1005 (P.1-4) / PS pump / GC-FID	0.5-2.5 L	0.01-0.20 L/min (1 hr)	0.23 0.07	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
42	1-Butanol /n-butyl alcohol	Sorbent Adsorption, GC Method	NIOSH 1401 (P.1-4) / PS pump / GC-FID	2-10 L	0.01-0.20 L/min (1 hr)	0.17 0.06	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
43	2-Butanol /sec-butyl alcohol	Sorbent Adsorption, GC Method	NIOSH 1401 (P.1-4) / PS pump / GC-FID	2-10 L	0.01-0.20 L/min (1 hr)	0.17 0.06	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
44	Isobutyl alcohol (IBA)	Sorbent Adsorption, GC Method	NIOSH 1401 (P.1-4) / PS pump / GC-FID	2-10 L	0.01-0.20 L/min (1 hr)	0.17 0.06	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
45	Methyl Isobutyl Ketone (MIBK)	Sorbent Adsorption, GC Method	OSHA 1004(P.1-27) / PS pump / GC-FID	0.25-12L	0.10 L/min (1 hr)	0.14 0.03	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
46	Ketones	Sorbent Adsorption, GC Method	NIOSH 2555 (P.1-5) / PS pump / GC-FID	0.5-10L	0.01-0.20 L/min (1 hr)	0.14 0.06	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
47	n-Butyl acetate	Sorbent Adsorption, GC Method	NIOSH 1450 (P.1-6) / PS pump / GC-FID	1-10L	0.01-0.20 L/min (1 hr)	0.38 0.08	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
48	n-Pentane	Sorbent Adsorption, GC Method	NIOSH 1500 (P.1-8) / PS pump / GC-FID	-	0.01-0.20 L/min (1 hr)	0.11 0.04	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
49	Chloroform	Sorbent Adsorption, GC Method	NIOSH 1003 (P.1-7) / PS pump / GC-FID	1-50L	0.01-0.20 L/min (1 hr)	0.21 0.04	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
50	Chlorobenzene	Sorbent Adsorption, GC Method	NIOSH 1003 (P.1-7) / PS pump / GC-FID	1.5-40L	0.01-0.20 L/min (1 hr)	0.19 0.04	mg / m ³ ppm	2	SKC Cat. No. ST 226-01
51	Formaldehyde	Sorbent Adsorption, GC Method	NIOSH 2541 (P.1-5) / PS pump / GC-FID	1-36L	0.01-0.10 L/min (1 hr)	0.01 0.01	mg / m ³ ppm	2	SKC Cat. No. 226-118
52	Hydrogen chloric	Sorbent Adsorption, IC Method	OSHA ID-174SG / PS pump / IC	1-7.5 L	0.20 L/min (24 hr)	0.015 0.010	mg / m ³ ppm	3	SKC Cat. No. 226-10-03
53	Hydrogen Bromide	Sorbent Adsorption, IC Method	OSHA ID165SG / PS pump / IC	1-96 L	0.20 L/min (24 hr)	0.033 0.010	mg / m ³ ppm	3	SKC Cat. No. 226-10-03
54	Sulfuric Acid	Sorbent Adsorption, IC Method	OSHA ID165SG / PS pump / IC NIOSH 7908 / PS pump / IC	1-96 L	0.20 L/min (24 hr)	0.040 0.010	mg / m ³ ppm	3	SKC Cat. No. 226-10-03 Fiter (PTFE)

Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
55	Phosphoric Acid	Sorbent Adsorption, IC Method	OSHA ID165SG / PS pump / IC NIOSH 7908 / PS pump / IC	1-96 L	0.20 L/min (24 hr)	0.040 0.010	mg / m ³ ppm	3	SKC Cat. No. 226-10-03 Fiter (PTFE)
56	Nitric	Sorbent Adsorption, IC Method	OSHA ID165SG / PS pump / IC	1-96 L	0.20 L/min (24 hr)	0.026 0.010	mg / m ³ ppm	3	SKC Cat. No. 226-10-03
57	Chlorine	Sorbent Adsorption, IC Method	OSHA ID-202 / PS pump / IC	14 L	0.20 L/min (24 hr)	0.029 0.010	mg / m ³ ppm	3	0.02% KI in Buffer
58	Ammonia (NH ₃)	Sorbent Adsorption, IC Method	NIOSH 6016 / PS pump / IC	0.10 - 96 L	0.20 L/min (120min)	0.200 0.280	mg / m ³ ppm	3	SKC Cat. No. 226-10-06
59	Hydrogen fluoride	Sorbent Adsorption, IC Method	OSHA ID165SG / PS pump / IC	60 L	0.2 L/min (60min)	0.008 0.010	mg / m ³ ppm	3	SKC Cat. No. 226-10-03

การตรวจวิเคราะห์คุณภาพอากาศ (Air Quality Analysis)

ประเภทตัวอย่าง : อากาศในปล่องระบาย - Stack Air Quality

ตารางที่ 1 สรุปข้อกำหนดการเก็บตัวอย่างและความสามารถในการทดสอบตัวอย่างของห้องปฏิบัติการ ตามที่ขึ้นทะเบียนกับกรมโรงงานอุตสาหกรรม

(ประเภทตัวอย่าง : อากาศในปล่องระบาย - Stack Air Quality)

Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
แผนปฏิบัติการภาคสนาม									
1	Smoke density (Opacity)	Ringelmann' s method	U.S. EPA Method 9 / Ringelmann' s Chart	-	-	-	%	2	
2	Oxide of Nitrogen	Chemilluminescence Method	U.S. EPA Method 7E / Nitrogen dioxide Analyzer	-	-	0.1 - 100	ppm	1	ใช้ Dilution Probe ร่วมในการตรวจวัด
3	Sulfur Dioxide	UV Fluorescence Method	U.S. EPA Method 6C / Sulfur dioxide Analyzer	-	-	0.4 - 100	ppm	1	ใช้ Dilution Probe ร่วมในการตรวจวัด
4	Carbon Monoxide	Bag,Non-Dispersive Infrared Method	U.S. EPA method 10 / Carbon monoxide analyzer	-	-	0.1 - 100	ppm	1	ใช้ Dilution Probe ร่วมในการตรวจวัด
ส่วนงานทดสอบพื้นฐาน									
1	Hydrogen Sulfide (H ₂ S)	Absorption, Iodometric Method	U.S. EPA Method 11 / Iodometric			8.0 6.0	mg / m ³ ppm	1	
2	Sulfur Dioxide (SO ₂)	Absorption Barium Thorin Titrimetric Method	U.S. EPA Method 6 / Titration	0.03 m ³	Isokinetic (30 min)	3.4 1.3	mg / m ³ ppm	1	
3	Sulfuric acid (H ₂ SO ₄)	Isokinetic, Barium Thorin Titrimetric Method	U.S. EPA Method 8 / Titration	0.9 m ³	Isokinetic (30 min)	0.05 0.01	mg / m ³ ppm	2	
4	Total Particulate Matter (TSP)	Isokinetic, Sampling / Gravimetric Method	U.S. EPA Method 5 / Gravimetric Method	-	-	0.1	mg / m ³	1	

Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
	ส่วนงานเครื่องมือทดสอบ								
1	Oxide of Nitrogen (Nitrogen)	Chemical Absorption, Colorimetric Method	U.S. EPA Method 7 / Spectrophotometer	2.0 L	Non-Isokinetic (30 min)	2.0 1.0	mg / m ³ ppm	1	
2	Xylene	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m ³	0.7 L/min (30 min)	2.05 0.47	mg / m ³ ppm	2	SKC Cat. No. 226-09
3	Vanadium (V)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-OES	0.9 m ³	Isokinetic (30 min)	0.005	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
4	Tin (Sn)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-OES	0.9 m ³	Isokinetic (30 min)	0.010	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
5	Selenium (Se)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-OES	0.9 m ³	Isokinetic (30 min)	0.010	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
6	Antimony (Sb)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.010	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
7	Arsenic (As)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.010	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
8	Cadmium (Cd)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.005	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
9	Chromium (Cr)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.005	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
10	Copper (Cu)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.005	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
11	Cobalt (Co)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.005	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
12	Lead and Inorganic Lead (Pb)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.005	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
13	Manganese (Mn)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.005	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
14	Nickel (Ni)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.005	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
15	Mercury (Hg)	Isokinetic, Sampling,Cold Vapor Technique-AAS Method	U.S. EPA Method 101 / AAS	0.053 m ³	Isokinetic (1.5 L/min)	0.0001	mg / m ³	4	Advantage MFS Cat No. GC5090 MM

การตรวจวิเคราะห์คุณภาพอากาศ (Air Quality Analysis)

(ประเภทตัวอย่าง : อากาศในปล่องระบาย - Stack Air Quality)

ตารางที่ 2 สรุปข้อกำหนดการเก็บตัวอย่างและความสามารถในการทดสอบตัวอย่างของห้องปฏิบัติการ ที่ไม่ได้ขึ้นทะเบียนกับกรมโรงงานอุตสาหกรรม

(ประเภทตัวอย่าง : อากาศในปล่องระบาย - Stack Air Quality)									
Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
	แผนปฏิบัติการภาคสนาม								
1	Sampling and Traverse point	U.S. EPA Recommend (Method 1)	U.S. EPA Method 1 / Calculation	-	-	-	-	-	
2	Velocity and Volumetric Flow rate		U.S. EPA Method 2 / Calculation	-	-	-	-	-	
3	Oxygen	Electrochemical Sensor	Modified U.S. EPA 3 / Electrochemical Sensor	-	-	0-20.9	%	1	
4	Moisture Content		U.S. EPA Method 4 / Calculation	-	-	-	-	2	
5	Carbon dioxide (CO ₂)	Electrochemical Sensor	Modified U.S. EPA 3 / Electrochemical Sensor	-	-	0-20.9	%	2	
	ส่วนงานทดสอบพื้นฐาน								
1	PM10,PM2.5	Isokinetic, Sampling / Gravimetric Method	U.S. EPA Method 201A / Gravimetric Method	-	-	0.1	mg / m ³	1	
	ส่วนงานเครื่องมือทดสอบ								
1	Aluminium (Al)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.005	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
2	Barium (Ba)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.005	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
3	Calcium (Ca)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.100	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
4	Iron (Fe)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.005	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
5	Magnesium (Mg)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.100	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
6	Beryllium (Be)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.005	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
7	Silver (Ag)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.005	mg / m ³	3	Advantage MFS Cat No. GC5090 MM

Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
8	Sodium (Na)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.100	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
9	Zinc (Zn)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.005	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
10	Acetone	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m ³	0.7 L/min (30 min)	1.88 0.79	mg / m ³ ppm	2	SKC Cat. No. 226-09
11	Benzene	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m ³	0.7 L/min (30 min)	1.68 0.52	mg / m ² ppm	2	SKC Cat. No. 226-09
12	Cyclohexanone	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m ³	0.7 L/min (30 min)	2.26 0.56	mg / m ² ppm	2	SKC Cat. No. 226-09
13	Ethanol (Ethyl alcohol)	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m ³	0.7 L/min (30 min)	1.88 1.00	mg / m ² ppm	2	SKC Cat. No. 226-09
14	Ethylbenzene	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m ³	0.7 L/min (30 min)	2.07 0.48	mg / m ² ppm	2	SKC Cat. No. 226-09
15	Ethylacetate	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m ³	0.7 L/min (30 min)	4.32 1.20	mg / m ² ppm	2	SKC Cat. No. 226-09
16	Hexane	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m ³	0.7 L/min (30 min)	4.23 1.20	mg / m ² ppm	2	SKC Cat. No. 226-09
17	Isopropanol (Isopropyl alcohol); IPA	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m ³	0.7 L/min (30 min)	1.87 0.76	mg / m ² ppm	2	SKC Cat. No. 226-09
18	Methanol (Methyl alcohol)	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m ³	0.7 L/min (30 min)	0.94 0.72	mg / m ² ppm	2	SKC Cat. No. 226-09
19	Methyl Ethyl Ketone (MEK)	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m ³	0.7 L/min (30 min)	1.92 0.65	mg / m ² ppm	2	SKC Cat. No. 226-09
20	Styrene	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m ³	0.7 L/min (30 min)	2.16 0.51	mg / m ² ppm	2	SKC Cat. No. 226-09
21	Toluene	Sorbent Adsorption, Gas Chromatography Method	US. EPA Method 18 / GC-FID	0.21 m ³	0.7 L/min (30 min)	2.07 0.55	mg / m ² ppm	2	SKC Cat. No. 226-09

Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
22	Methylcyclohexane	Sorbent Adsorption, Gas Chromatography Method	U.S.EPA Method18/SKC.Guide/ GC-FID	2-23 L	0.10 L/min (1 hr)	4.02 1.00	mg / m ³ ppm	2	SKC Cat. No. ST 226-09
23	Diethyl Ether or Ethyl Ether	Sorbent Adsorption, Gas Chromatography Method	U.S.EPA Method18/SKC.Guide/ GC-FID	0.25-3 L	0.01-0.20 L/min (1 hr)	11.88 3.92	mg / m ³ ppm	2	SKC Cat. No. ST 226-09
24	Methyl tert-Butyl Ether (MTBE)	Sorbent Adsorption, Gas Chromatography Method	U.S.EPA Method18/SKC.Guide/ GC-FID	2-96 L	0.01-0.20 L/min (1 hr)	3.08 0.86	mg / m ³ ppm	2	SKC Cat. No. ST 226-09
25	Dichloromethane	Sorbent Adsorption, Gas Chromatography Method	U.S.EPA Method18/SKC.Guide/ GC-FID	0.5-2.5 L	0.01-0.20 L/min (1 hr)	3.16 0.91	mg / m ³ ppm	2	SKC Cat. No. ST 226-09
26	1-Butanol /n-butyl alcohol	Sorbent Adsorption, Gas Chromatography Method	U.S.EPA Method18/SKC.Guide/ GC-FID	2-10 L	0.01-0.20 L/min (1 hr)	2.31 0.76	mg / m ³ ppm	2	SKC Cat. No. ST 226-09
27	2-Butanol /sec-butyl alcohol	Sorbent Adsorption, Gas Chromatography Method	U.S.EPA Method18/SKC.Guide/ GC-FID	2-10 L	0.01-0.20 L/min (1 hr)	2.31 0.76	mg / m ³ ppm	2	SKC Cat. No. ST 226-09
28	Isobutyl alcohol (IBA)	Sorbent Adsorption, Gas Chromatography Method	U.S.EPA Method18/SKC.Guide/ GC-FID	2-10 L	0.01-0.20 L/min (1 hr)	2.29 0.76	mg / m ³ ppm	2	SKC Cat. No. ST 226-09
29	Thallium (Tl)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.010	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
30	Ketones	Sorbent Adsorption, Gas Chromatography Method	NIOSH2555 (P.1-5) / PS pump / GC-FID	21 L	0.70 L/min (1 hr)	1.88 0.79	mg / m ³ ppm	2	SKC Cat. No. 226-09
31	n-Heptane	Sorbent Adsorption, Gas Chromatography Method	NIOSH1500 (P.1-8) / PS pump / GC-FID	21 L	0.70 L/min (1 hr)	3.89 0.95	mg / m ³ ppm	2	SKC Cat. No. 226-09
32	n-Butyl acetate	Sorbent Adsorption, Gas Chromatography Method	NIOSH 1450(P.1-6) / PS pump / GC-FID	21 L	0.70 L/min (1 hr)	4.75 1.00	mg / m ³ ppm	2	SKC Cat. No. 226-09
33	n-Pentane	Sorbent Adsorption, Gas Chromatography Method	NIOSH 1500(P.1-8) / PS pump / GC-FID	21 L	0.70 L/min (1 hr)	1.50 0.51	mg / m ³ ppm	2	SKC Cat. No. 226-09
34	Chloroform	Sorbent Adsorption, Gas Chromatography Method	NIOSH1003 (P.1-7) / PS pump / GC-FID	21 L	0.70 L/min (1 hr)	2.82 0.58	mg / m ³ ppm	2	SKC Cat. No. 226-09
35	Chlorobenzene	Sorbent Adsorption, Gas Chromatography Method	NIOSH1003 (P.1-7) / PS pump / GC-FID	21 L	0.70 L/min (1 hr)	2.64 0.57	mg / m ³ ppm	2	SKC Cat. No. 226-09

Items	Parameter	Method	Reference Method / Analytical Technique	Air Volume	Sampling Rate / Period	LOQ / Range	Unit	Decimal point	Remark
36	Formaldehyde	Sorbent Adsorption, Gas Chromatography Method	NIOSH2541 (P.1-5) / PS pump / GC-FID	21 L	0.70 L/min (1 hr)	0.31 0.25	mg / m ³ ppm	2	SKC Cat. No. 226-118
37	Hydrogen chloride	Sorbent Adsorption, IC Method	U.S. EPA Method 26A /IC	0.12 m3	1 L/min (30 min)	0.015 0.010	mg / m ³ ppm	3	0.1 N H2SO4 / 0.1 N
38	Hydrogen fluoride	Sorbent Adsorption, IC Method	U.S. EPA Method 26A /IC	0.12 m3	1 L/min (30 min)	0.012 0.015	mg / m ³ ppm	3	0.1 N H2SO4 / 0.1 N
39	Nitric	Sorbent Adsorption, IC Method	U.S. EPA Method 26A /IC	0.029 m3	1 L/min (30 min)	0.026 0.010	mg / m ³ ppm	3	Milli-Q Water
40	Chlorine	Sorbent Adsorption, IC Method	U.S. EPA Method 26A /IC	0.12 m3	1 L/min (30 min)	0.029 0.010	mg / m ³ ppm	3	0.1 N H2SO4 / 0.1 N
41	Molybdenum (Mo)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.005	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
42	Titanium (Ti)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.005	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
43	Boron (B)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.005	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
44	Silicon (Si)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.005	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
45	Potassium (K)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.100	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
46	Phosphorus (P)	Isokinetic, Sampling,Digestion,ICP-OES Method	U.S. EPA Method 29 / ICP-AES	0.9 m ³	Isokinetic (30 min)	0.100	mg / m ³	3	Advantage MFS Cat No. GC5090 MM
47	Phosphoric acid	Sorbent Adsorption, IC Method	U.S. EPA Method 26A /IC	0.12 m3	1 L/min (30 min)	0.040 0.010	mg / m ³ ppm	3	SKC Cat. No. 226-10-03

เอกสารอ้างอิง

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5. International Standard Organization, ISO 11204:1995
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การตรวจวิเคราะห์คุณภาพน้ำ – กากตะกอน (Water – Solid wastes Quality Analysis)

ตารางที่ 1 สรุปข้อกำหนดการเก็บตัวอย่างและความสามารถในการทดสอบตัวอย่างของห้องปฏิบัติการ ตามที่ขึ้นทะเบียนกับกรมโรงงานอุตสาหกรรม

(ประเภทตัวอย่าง : น้ำเสีย(ขึ้นทะเบียนกับกรมโรงงานฯ), น้ำ,น้ำเพื่ออุปโภค, น้ำประปา, น้ำผิวดิน, น้ำบาดาล และน้ำทะเล))

ส่วนงาน : ส่วนงานทดสอบพื้นฐาน

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
1.1	Biochemical Oxygen Demand (BOD ₅)	5-Day BOD Test, Membrane Electrode Method	Standard Method part 5210 B, 4500-O G / DO meter	Plastic	1000	-	2.0	mg/l	1	
1.2	Biochemical Oxygen Demand (BOD ₅)	5-Day BOD Test, Azide Modification Method	Standard Method part 5210 B, 4500-O C / Titration	Plastic	1000	-	2.0	mg/l	1	
2.1	Chemical Oxygen Demand (COD)	In-house Method	Standard Method part 5220 C / Titration	Plastic	100	-	40.0	mg/l as O ₂	0	
2.2	Chemical Oxygen Demand (COD)	Titrimetric, Closed Reflux Method	Standard Method part 5220 C / Titration	Plastic	100	-	40	mg/l as O ₂	0	
3	Free Chlorine	Iodometric Method	Standard Method part 4500-B / Titration	Plastic	100	-	0.50	mg/l	2	
4	Total Dissolved Solids (TDS)	Dried at 180 °C	Standard Method part 2540 C / Gravimetric	Plastic	200	-	25	mg/l	0	
5.1	Grease&Oil	In-house Method	Standard Method part 5520 B / Gravimetric	Glass	1000	-	3.0	mg/l	1	
5.2	Grease&Oil	Partition Gavimetric Method	Standard Method part 5520 B / Gravimetric	Glass	1001	-	3.0	mg/l	1	
6	Sulfide (S ₂ ⁻)	ZnS Precipitation ,Iodometric Method	Standard Method part 4500-S ²⁻ F / Titration	BOD bottle	300	-	0.50	mg/l as H ₂ S	2	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
7	pH	Electrometric Method	Standard Method part 4500 H ⁺ / pH meter	Plastic	50	-	3.0-12.0	-	1	
8	Total Suspended Solids (TSS)	Dried at 103-105 °C	Standard Method part 2540 D / Grvimetric	Plastic	1000	-	5	mg/l	0	
9	Temperature	Laboratory and Field Method	Standard Method part 2550 B / Thermometer	at field		-	1	°C	0	
10	Total Kjeldahl Nitrogen (TKN)	Macro-Kjeldahl Method	Standard Method part 4500-N _{org} / Titration	Plastic	500	-	5	mg/l as NH ₃ -N	0	
11	Hydrogen Sulfide (H ₂ S)	ZnS Precipitation ,Iodometric Method	Standard Method part 4500-S ²⁻ F / Titration	BOD bottle	300	-	0.53	mg/l as H ₂ S	2	

การตรวจวิเคราะห์คุณภาพน้ำ – ภาคตะกอน (Water – Solid wastes Quality Analysis)

ตารางที่ 2 สรุปข้อกำหนดการเก็บตัวอย่างและความสามารถในการทดสอบตัวอย่างของห้องปฏิบัติการ ตามที่ขึ้นทะเบียนกับกรมโรงงานอุตสาหกรรม

(ประเภทตัวอย่าง : น้ำใต้ดิน)

ส่วนงาน : ส่วนงานทดสอบพื้นฐาน

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
1	pH	Electrometric Method	Standard Method part 4500 H ⁺ / pH meter	Plastic	50	-	3.0-12.0	-	1	

การตรวจวิเคราะห์คุณภาพน้ำ – ภาคตะกอน (Water – Solid wastes Quality Analysis)

ตารางที่ 3 สรุปข้อกำหนดการเก็บตัวอย่างและความสามารถในการทดสอบตัวอย่างของห้องปฏิบัติการ ที่ไม่ได้ขึ้นทะเบียนกับกรมโรงงานอุตสาหกรรม

(ประเภทตัวอย่าง : น้ำ, น้ำเสีย, น้ำเพื่ออุปโภค, น้ำประปา, น้ำผิวดิน, น้ำบาดาล และน้ำทะเล)

ส่วนงาน : ส่วนงานทดสอบพื้นฐาน

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
1	Acidity	Titration Method	Standard Method part 2310 B / Titration	Plastic	50	-	20.0	mg/l as CaCO ₃	1	
2	M-Alkalinty	Titration Method	Standard Method part 2320 B / Titration	Plastic	50	-	20.0	mg/l as CaCO ₃	1	
3	P-Alkalinty	Titration Method	Standard Method part 2320 B / Titration	Plastic	50	-	20.0	mg/l as CaCO ₃	1	
4	Ammonia Nitrogen (NH ₃ -N)	Distillation and Titrimetric Method	Standard Method part 4500-NH ₃ ⁺ / Titration	Plastic	500		2	mg/l as NH ₃ -N	0	
5	Calcium Hardness	EDTA Titrimetric Method	Standard method part 3500-Ca B/ Titration	Plastic	100	-	3.0	mg/l as CaCO ₃	1	
6	Chloride (Cl ⁻)	Argentometric Method	Standard Method part 4500-Cl ⁻ B / Titration	Plastic	50	-	5.0	mg/l as Cl ⁻	1	
7	Chlorine (Residual)	DPD Colorimetric Method	Standard Method part 4500-Cl G / Test kit	Plastic	500	-	0.1	mg/l as Cl ₂	1	
8	Chlorine (Total)	DPD Colorimetric Method	Modified Standard Method part 4500-Cl G / Test kit	Plastic	500	-	0.1	mg/l as Cl ₂	1	
9	Fixed Solids (FS)	Dried at 550 °C	Standard Method part 2540 E / Gravimetric	Plastic	200	-	30.0	mg/l	1	
10	Hardness	EDTA Titrimetric Method	Standard Method part 2340 C / Titration	Plastic	100	-	6.0	mg/l as CaCO ₃	1	
11	Magnesium (Mg)	Calculation Method	Standard Method part 3500-Mg / Calculation	Plastic	100	-	0.70	mg/l as Mg	1	
12	Magnesium Hardness	Calculation Method	Standard Method part 3500-Mg / Calculation	Plastic	100	-	3.0	mg/l as CaCO ₃	1	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
	ส่วนงานจุลชีววิทยา									
1	Benthos	Counting Chamber Method	Standard Method part 10500 B / Counting	ถุงดำ	-	-	-	ind/m ²	0	รายงานค่าสุด =Not found
2	Escherichia Coli Bacteria (E.coli)	MPN Test	Standard Method part 9221 F / Fluorogenic Substrate , MPN	Glass	250	-	-	MPN:100 ml	ตามตาราง MPN-	รายงานค่าสุด 1.1 (น้ำดื่ม) / 1.8 (น้ำ)
3	Total Coliform	MPN Test	Standard Method part 9221 B / Fermentation Technique , MPN	Glass	250	-	-	MPN:100 ml	ตามตาราง MPN-	รายงานค่าสุด 1.1 (น้ำดื่ม) / 1.8 (น้ำ)
4	Thermotolerant coliforms (Fecal Coliform)	MPN Test	Standard Method part 9221 E /Thermolerant Coliform , MPN	Glass	250	-	-	MPN:100 ml	ตามตาราง MPN-	รายงานค่าสุด 1.1 (น้ำดื่ม) / 1.8 (น้ำ)
5	Heterotrophic Bacteria (Total Bacteria)	Heterotrophic plate count (Standard Plate Count Method)	Standard Method part 9215 B / Pour plate	Glass	250	1	1	Colonies/cm ³	0	*Heterotrophic plate count = Standard
6	Phytoplankton	Counting Chamber Method	Standard Method part 10200 F / Counting	Plstic	-	-	-	Cell / l	0	รายงานค่าสุด =Not found
7	Zooplankton	Counting Chamber Method	Standard Method part 10200 G / Counting	Plastic	-	-	-	ind./l	0	รายงานค่าสุด =Not found
8	S.Aureus	Enrichment	Standard Method part 9213 B	Glass	1000	-	-	-	รายงานพบ/ไม่พบ	รายงานค่าสุด =Not found
9	Salmonella sp.	Membrane Filter	Standard Method part 9260 B	Glass	1000	-	-	-	รายงานพบ/ไม่พบ	รายงานค่าสุด =Not found
10	Clostridium perfringens	Comperndium 2003,Chapter 34	Comperndium 2003,Chapter 34	Glass	1000	-	-	-	รายงานพบ/ไม่พบ	รายงานค่าสุด =Not found

การตรวจวิเคราะห์คุณภาพน้ำ – ภาคตะกอน (Water – Solid wastes Quality Analysis)

ตารางที่ 4 สรุปข้อกำหนดการเก็บตัวอย่างและความสามารถในการทดสอบตัวอย่างของห้องปฏิบัติการ ตามที่ขึ้นทะเบียนกับกรมโรงงานอุตสาหกรรม

(ประเภทตัวอย่าง : น้ำเสีย(ขึ้นทะเบียนกรมโรงงานฯ), น้ำ,น้ำเพื่ออุปโภค, น้ำประปา, น้ำผิวดิน, น้ำบาดาล และน้ำทะเล)

ส่วนงาน : ส่วนงานเครื่องมือทดสอบ

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
1	Arsenic (As)	Continuous Hydride Generation /Atomic Absorption Spectrometric Method	Standard Method Part 3114 B and 3114C / AAS	Plastic	500	0.0005	0.0	mg/l as As	4	น้ำทะเล MDL/LOQ = 1.00/2.00 ug/l
2	Barium (Ba)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.02	0.0	mg/l as Ba	2	น้ำทะเล MDL/LOQ = 20/30 ug/l
3	Cadmium (Cd)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.02	0.0	mg/l as Cd	2	น้ำทะเล MDL/LOQ = 20/30 ug/l
4	Chromium (Cr)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.02	0.03	mg/l as Cr	0	น้ำทะเล MDL/LOQ = 20/30 ug/l
5	Color	ADMI Weighted-Ordinate Spectrophotometer Method	Standard Method part 2120 F / Spectrophotometer	Plastic	500	10	20	ADMI	0	
6	Chromium Hexavalence (Cr ⁶⁺)	Filtration,Colorimetric Method	Standard Method part 3500-Cr B / Spectrophotometer	Plastic	500	0.003	0.050	mg/l as Cr ⁶⁺	3	น้ำทะเล MDL/LOQ = 3.00/50.0 ug/l
7	Copper (Cu)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.02	0.03	mg/l as Cu	2	น้ำทะเล MDL/LOQ = 20/30 ug/l
8	Cyanide (CN ⁻)	Distillation, Colorimetric Method	Standard Method part 4500 CN- C,E/ Spectrophotometer	Plastic	500	0.008	0.020	mg/l	3	น้ำทะเล MDL/LOQ = 8/20 ug/l
9	Formaldehyde	Distillation, Colorimetric Method	คู่มือวิเคราะห์น้ำเสีย,สมาคมวิศวกรรมสิ่งแวดล้อมแห่งประเทศไทย	Plastic	100	0.20	0.50	mg/l	2	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
20	สารฆ่าศัตรูพืชและสัตว์	Liquid-Liquid Extraction Gas Chromatography	Standard Method part 6630B/GC and APHA Method part 6410B/GC-MS	Glass	2500	0.03	0.05	ug/l	2	
	- alpha - BHC					0.02	0.05	ug/l	2	
	- beta - BHC					0.03	0.05	ug/l	2	
	- gamma - BHC					0.03	0.05	ug/l	2	
	- delta - BHC					0.03	0.05	ug/l	2	
	- Heptachlor					0.03	0.05	ug/l	2	
	- Aldrin					0.03	0.05	ug/l	2	
	- Heptachlor epoxide					0.03	0.05	ug/l	2	
	- Endosulfan I					0.03	0.05	ug/l	2	
	- p,p - DDE					0.03	0.05	ug/l	2	
	- Dieldrin					0.03	0.05	ug/l	2	
	- Endrin ketone					0.03	0.05	ug/l	2	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
	- Endosulfan II					0.03	0.05	ug/l	2	
	- p,p - DDD					0.03	0.05	ug/l	2	
	- Endrin Aldehyde					0.03	0.05	ug/l	2	
	- Endosulfan Sulfate					0.03	0.05	ug/l	2	
	- trans Chlordane					0.03	0.05	ug/l	2	
	- cis Chlordane					0.03	0.05	ug/l	2	
	- DDT		Standard Method part 6410B/GC-MS			0.03	0.05	ug/l	2	
	- Endrin					0.05	0.10	ug/l	2	
	- Methoxychlor					0.03	0.05	ug/l	2	

การตรวจวิเคราะห์คุณภาพน้ำ – ภาคตะกอน (Water – Solid wastes Quality Analysis)

ตารางที่ 6 สรุปข้อกำหนดการเก็บตัวอย่างและความสามารถในการทดสอบตัวอย่างของห้องปฏิบัติการ ที่ไม่ได้ขึ้นทะเบียนกับกรมโรงงานอุตสาหกรรม

(ประเภทตัวอย่าง : น้ำ, น้ำเสีย, น้ำใต้ดิน, น้ำเพื่ออุปโภค, น้ำประปา, น้ำผิวดิน, น้ำบาดาล และน้ำทะเล)

ส่วนงาน : ส่วนงานเครื่องมือทดสอบ

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
1	Antimony (Sb)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.05	0.1	mg/l as Sb	2	
2	Aluminium (Al)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.05	0.1	mg/l as Al	2	
3	Boron (B)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.01	0.0	mg/l as B	2	
4	Calcium (Ca)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.50	1.00	mg/l as Ca	0	
5	Cadmium (Cd)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.002	0.003	mg/l as Cd	3	น้ำดื่ม
6	Cobalt (Co)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.01	0.02	mg/l as Co	2	
7	Color	Spectrophotometric Method	Standard Method part 2120 C / Spectrophotometer	Plastic	500	0.50	1.00	Pt-Co	2	
8	Iron (Fe)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.02	0.03	mg/l as Fe	2	
9	Lead (Pb)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.005	0.010	mg/l as Pb	3	น้ำดื่ม
10	Magnesium (Mg)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.50	1.00	mg/l as Mg	2	
11	Molybdenum (Mo)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.01	0.02	mg/l as Mo	2	
12	Nitrite (NO ₂ ⁻)	Colorimetric Method	Standard Method part 4500-NO ₂ ⁻ B /	Plastic	500	0.003	0.030	mg/l as NO ₂ ⁻	3	
13	Nitrite-Nitrogen	Colorimetric Method	Standard Method part 4500-NO ₂ ⁻ B /	Plastic	500	0.001	0.010	mg/l as NO ₂ ⁻ -N	3	
14	Nitrate (NO ₃ ⁻)	Colorimetric Method	Standard Method part 4500-NO ₃ ⁻ B /	Plastic	500	0.09	0.44	mg/l as NO ₃ ⁻	2	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
15	Nitrate-Nitrogen (NO ₃ ⁻ -N)	Colorimetric Method	Standard Method part 4500-NO ₃ ⁻ B / Spectrophotometer	Plastic	500	0.02	0.10	mg/l as NO ₃ ⁻ -N	2	
16	Potassium (K)	Direct Aspiration-AAS Method	Standard Method part 3111 B / AAS	Plastic	500	0.008	0.025	mg/l as K	3	
17	Potassium (K)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.50	1.00	mg/l as K	2	
18	Selenium (Se)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.05	0.10	mg/l as Se	2	
19	Silica (SiO ₂)	Molybdosilicate Method	Standard Method part 4500-SiO ₂ C / Spectrophotometer	Plastic	500	1.00	2.00	mg/l as SiO ₂	2	
20	Silicon (Si)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.02	0.05	mg/l as Si	2	
21	Silver (Ag)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.02	0.05	mg/l as Ag	2	
23	Sodium (Na)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.50	1.00	mg/l as Na	2	
24	Sodium Absorption Ratio	Calculation,Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.50	1.00	-	2	
25	Strontium (Sr)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.01	0.02	mg/l as Sr	2	
26	Tin (Sn)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.05	0.10	mg/l as Sn	2	
27	Titanium (Ti)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.01	0.02	mg/l as Ti	2	
28	Thallium (Tl)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.05	0.10	mg/l as Tl	2	
29	Vanadium (V)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.01	0.02	mg/l as V	2	
30	Phosphate (PO ₄ ³⁻)	Ascorbic Acid Method	Standard Method part 4500-PO ₄ ³⁻ B/ Spectrophotometer	Plastic	500	0.03	0.46	mg/l as P	2	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
31	Phosphorus (P)	Ascorbic Acid Method	Standard Method part 4500-P B/ Spectrophotometer	Plastic	500	0.05	0.15	mg/l as PO ₄ ³⁻	2	
32	Sulfate (SO ₄ ²⁻)	Turbidimetric Method	Standard Method part 4500-SO ₄ ²⁻ E/ Spectrophotometer	Plastic	500	1.50	5.00	mg/l as SO ₄ ²⁻	2	
33	Surfactant (LAS)	Anionic Surfactants as MBAS	Standard Method Part 5540 C / Spectrophotometer	Plastic	500	0.35	0.40	mg/l as MBAS	2	
34	Surfactant (LAS)	Anionic Surfactants as MBAS	Standard Method Part 5540 C / Spectrophotometer	Plastic	1000	0.08	0.10	mg/l as MBAS	2	น้ำดื่ม
35	Fluoride (F ⁻)	Ion-Selective Electrode Method	Standard Method part 4500-F- C/ Spectrophotometer	Plastic	100	0.20	0.50	mg/l as F ⁻	2	
36	Gold (Au)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.02	0.05	mg/l as Au	2	
37	Phosphorus (P)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.50	1.00	mg/l as P	2	
38	Chlorine (Residual)	Spectrophotometric Method	Standard Method part 4500-Cl G / Spectrophotometer	Plastic	500	0.03	0.05	mg/l as Cl ₂	2	
39	Beryllium	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F,3120 B / ICP-OES	Plastic	500	0.01	0.02	mg/l as B	2	

การตรวจวิเคราะห์คุณภาพน้ำ – ภาคตะกอน (Water – Solid wastes Quality Analysis)

ตารางที่ 5 สรุปข้อกำหนดการเก็บตัวอย่างและความสามารถในการทดสอบตัวอย่างของห้องปฏิบัติการ ตามที่ขึ้นทะเบียนกับกรมโรงงานอุตสาหกรรม

(ประเภทตัวอย่าง : น้ำใต้ดิน)

ส่วนงาน : ส่วนงานเครื่องมือทดสอบ

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
1	Antimony (Sb)	Digestion, Inductively Coupled Plasma Method	Standard Method part3030F and 3120 B / ICP-OES	Plastic	500	0.05	0.1	mg/l as Sb	2	
2	Arsenic (As)	Continuous Hydride Generation-ICP-OES Method	Standard Method part3030F and 3120 B / ICP-OES	Plastic	500	0.0010	0.0	mg/l as As	4	
3	Arsenic (As)	Continuous Hydride Generation /Atomic Absorption Spectrometric Method	Standard Method Part 3114 B and 3114 C / AAS	Plastic	500	0.0005	0.0	mg/l as As	4	
4	Barium (Ba)	Digestion, Inductively Coupled Plasma Method	Standard Method part3030F and 3120 B / ICP-OES	Plastic	500	0.02	0.03	mg/l as Ba	0	
5	Beryllium (Be)	Digestion, Inductively Coupled Plasma Method	Standard Method part3030F and 3120 B / ICP-OES	Plastic	500	0.005	0.01	mg/l as Be	2	
6	Cadmium (Cd)	Digestion, Inductively Coupled Plasma Method	Standard Method part3030F and 3120 B / ICP-OES	Plastic	500	0.002	0.003	mg/l as Cd	3	
7	Chromium (Cr)	Digestion, Inductively Coupled Plasma Method	Standard Method part3030F and 3120 B / ICP-OES	Plastic	500	0.02	0.03	mg/l as Cr	2	
8	Cyanide (CN ⁻)	Distillation, Colorimetric Method	Standard Method part 4500 CN ⁻ C,E/ Spectrophotometer	Plastic	500	0.008	0.020	mg/l	3	
9	Chromium Hexavalence (Cr ⁶⁺)	Filtration,Colorimetric Method	Standard Method part 3500-Cr B/ Spectrophotometer	Plastic	500	0.003	0.050	mg/l as Cr ⁶⁺	3	
10	Lead (Pb)	Digestion, Inductively Coupled Plasma Method	Standard Method part3030F and 3120 B / ICP-OES	Plastic	500	0.005	0.010	mg/l as Pb	3	
11	Manganese (Mn)	Digestion, Inductively Coupled Plasma Method	Standard Method part3030F and 3120 B / ICP-OES	Plastic	500	0.02	0.03	mg/l as Mn	2	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
12	Mercury (Hg)	Digestion, Cold Vapor Atomic Absorption Spectrometric Method	Standard Method part 3112 B / AAS	Plastic	500	0.0005	0.0010	mg/l as Hg	4	
13	Nickel (Ni)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.02	0.03	mg/l as Ni	2	
14	Phenols	Distillation, Direct Photometric Method	Standard Method part 5530 D / Spectrophotometer	Plastic	500	0.002	0.005	mg/l	3	
15	Silver (Ag)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.02	0.05	mg/l as Ag	2	
16	Trivalent Chromium (Cr ³⁺)	Digestion, Direct Aspiration-AAS Method; Filtration, Colorimetric Method; Calculation	Standard Method part 3500-Cr B & part 3111B / AAS	Plastic	500	0.05	0.10	mg/l	2	
17	Trivalent Chromium (Cr ³⁺)	Digestion, ICP-OES Method; Filtration, Colorimetric Method; Calculation	Standard Method part 3500-Cr B & part 3120B / ICP-OES	Plastic	500	0.02	0.03	mg/l	2	
18	Vanadium (V)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.01	0.02	mg/l as V	2	
19	Zinc (Zn)	Digestion, Inductively Coupled Plasma Method	Standard Method part 3030F and 3120 B / ICP-OES	Plastic	500	0.02	0.03	mg/l as Zn	2	
20	Selenium (Se)	Digestion, Hydride Generation / Atomic Absorption Spectrometric Method	Standard Method part 3030F, 3114 B and 3114C	Plastic	500	0.0005	0.0020	mg/l	4	เริ่มทดสอบ 1 ม.ก. 2565
21	Volatile organic compounds; VOC#1	Purge-and-Trap / GC-MS	Standard Method part 6200B	Glass	40 *4					
2	- Bromodichloromethane					0.00050	0.00050	mg/l	5	
3	- Bromoform					0.00050	0.00050	mg/l	5	
4	- Carbon tetrachloride					0.00025	0.00025	mg/l	5	
5	- Chlorobenzene					0.00025	0.00050	mg/l	5	
6	- Chlorodibromomethane					0.00050	0.00100	mg/l	5	
7	- 1,2-Dichlorobenzene					0.00025	0.00050	mg/l	5	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
8	- 1,3-Dichlorobenzene					0.00025	0.00025	mg/l	5	
9	- 1,4-Dichlorobenzene					0.00025	0.00025	mg/l	5	
10	- 1,1-Dichloroethane					0.00025	0.00025	mg/l	5	
11	- 1,2-Dichloroethane					0.00025	0.00050	mg/l	5	
12	- 1,1-Dichloroethylene					0.00025	0.00050	mg/l	5	
13	- cis-1,2-Dichloroethylene					0.00050	0.00050	mg/l	5	
14	- trans-1,2-Dichloroethylene					0.00025	0.00050	mg/l	5	
15	- 1,2-Dichloropropane					0.00025	0.00050	mg/l	5	
16	- 1,3-Dichloropropane					0.00025	0.00050	mg/l	5	
17	- Ethylbenzene					0.00025	0.00050	mg/l	5	
18	- Methyl tert-butyl ether					0.00025	0.00050	mg/l	5	
19	- Naphthalene					0.00025	0.00100	mg/l	5	
20	- Nitrobenzene					0.00025	0.00025	mg/l	5	
21	- Styrene					0.00050	0.00100	mg/l	5	
22	- 1,1,2,2-Tetrachloroethane					0.00050	0.00050	mg/l	5	
23	- Tetrachloroethylene					0.00025	0.00050	mg/l	5	
24	- Toluene					0.00025	0.00050	mg/l	5	
25	- 1,2,4-Trichlorobenzene					0.00025	0.00050	mg/l	5	
26	- 1,1,1-Trichloroethane					0.00025	0.00025	mg/l	5	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
27	- 1,1,2-Trichloroethane					0.00025	0.00050	mg/l	5	
28	- Trichloroethylene					0.00025	0.00050	mg/l	5	
29	- 1,3,5-Trimethylbenzene					0.00025	0.00100	mg/l	5	
30	- Vinyl acetate					0.00050	0.00100	mg/l	5	
31	- Vinyl Chloride					0.00025	0.00025	mg/l	5	
32	- m-Xylene					0.00025	0.00100	mg/l	5	
33	- o-Xylene					0.00025	0.00100	mg/l	5	
34	- p-Xylene					0.00025	0.00100	mg/l	5	
35	- Xylene Total					0.00025	0.00100	mg/l	5	
22	Volatile organic compounds;VOC#2	Purge-and-Trap / GC-MS Method	Standard Method part 6200B	Glass	40 *4					
1	- Acetone					0.00100	0.00100	mg/l	5	
2	- Butanol					0.00100	0.00100	mg/l	5	
3	- Carbon disulfide					0.00200	0.00500	mg/l	5	
4	- Chloroform					0.00100	0.00200	mg/l	5	
5	- n-Hexane					0.00100	0.00200	mg/l	5	
6	- Dichloromethane					0.00200	0.00200	mg/l	5	
23	Semivolatile organic compounds #1	Liquid-Liquid Extraction / GC-MS (SM: 6410B)	Standard Method part 6410B	Glass	2500					
1	Acenaphthene					0.0005	0.0010	mg/l	4	
2	Anthracene					0.0005	0.0010	mg/l	4	
3	Benz[a]anthracene					0.0005	0.0010	mg/l	4	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
4	Benzo[b]fluoranthene					0.0005	0.0010	mg/l	4	
5	Benzo[k]fluoranthene					0.0005	0.0010	mg/l	4	
6	Benzo[a]pyrene					0.0005	0.0010	mg/l	4	
7	Benzo[ghi]perylene					0.0005	0.0010	mg/l	4	
8	Bis(2-chloroethyl) ether					0.0005	0.0100	mg/l	4	
9	Bis(2-ethylhexyl) phthalate					0.0005	0.0010	mg/l	4	
10	Butyl benzyl phthalate					0.0005	0.0010	mg/l	4	
11	Carbazole					0.0005	0.0010	mg/l	4	
12	p-Chloroaniline					0.0005	0.0100	mg/l	4	
13	2-Chlorophenol					0.0005	0.0010	mg/l	4	
14	Chrysene					0.0005	0.0010	mg/l	4	
15	Dibenz[a,h]anthracene					0.0005	0.0010	mg/l	4	
16	Di-n-butyl phthalate					0.0005	0.0100	mg/l	4	
17	2,4-Dichlorophenol					0.0005	0.0010	mg/l	4	
18	Diethyl Phthalate					0.0005	0.0010	mg/l	4	
19	2,4-Dimethylphenol					0.0005	0.0010	mg/l	4	
20	2,4-Dinitrotoluene					0.0005	0.0010	mg/l	4	
21	2,6-Dinitrotoluene					0.0005	0.0010	mg/l	4	
22	Di-n-octyl phthalate					0.0005	0.0010	mg/l	4	
23	Fluoranthene					0.0005	0.0010	mg/l	4	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
24	Fluorene					0.0005	0.0010	mg/l	4	
25	Hexachlorobenzene					0.0005	0.0010	mg/l	4	
26	Hexachloro-1,3-butadiene					0.0005	0.0010	mg/l	4	
27	Hexachlorocyclopentadiene					0.0005	0.0100	mg/l	4	
28	Hexachloroethane					0.0005	0.0010	mg/l	4	
29	Indeno[1,2,3-cd]pyrene					0.0005	0.0010	mg/l	4	
30	Isophorone					0.0005	0.0010	mg/l	4	
31	2-Methylphenol (o-Cresol)					0.0005	0.0010	mg/l	4	
32	2-Methylnaphthalene					0.0005	0.0010	mg/l	4	
33	N-Nitrosodi-n-propylamine					0.0005	0.0010	mg/l	4	
34	Phenanthrene					0.0005	0.0010	mg/l	4	
35	Phenol					0.0005	0.0010	mg/l	4	
36	Pyrene					0.0005	0.0010	mg/l	4	
37	2,4,5-Trichlorophenol					0.0005	0.0010	mg/l	4	
38	2,4,6-Trichlorophenol					0.0005	0.0010	mg/l	4	
24	Semivolatile organic compounds #2	Liquid-Liquid Extraction / GC-MS (SM: 6410B)	Standard Method part 6410B	Glass	2500	0.030	0.050	µg/l	3	
1	Aldrin					0.030	0.050	µg/l	3	
2	Chlordane					0.030	0.050	µg/l	3	
3	DDD					0.030	0.050	µg/l	3	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
4	DDE					0.030	0.050	µg/l	3	
5	DDT					0.030	0.050	µg/l	3	
6	Dieldrin					0.030	0.050	µg/l	3	
7	Endosulfan					0.030	0.050	µg/l	3	
8	Endrin					0.050	0.100	µg/l	3	
9	Heptachlor					0.030	0.050	µg/l	3	
10	Heptachlor epoxide					0.030	0.050	µg/l	3	
11	alpha - BHC					0.020	0.050	µg/l	3	
12	beta - BHC					0.030	0.050	µg/l	3	
13	gamma - BHC					0.030	0.050	µg/l	3	
14	Methoxychlor					0.030	0.050	µg/l	3	

การตรวจวิเคราะห์คุณภาพน้ำ – ภาคตะกอน (Water – Solid wastes Quality Analysis)
ตารางที่ 7 สรุปข้อกำหนดการเก็บตัวอย่างและความสามารถในการทดสอบตัวอย่างของห้องปฏิบัติการ ตามที่ขึ้นทะเบียนกับกรมโรงงานอุตสาหกรรม

(ประเภทตัวอย่าง : ภาคตะกอน ตามประกาศเรื่องสิ่งปฏิกูลที่ไม่ใช่แล้ว และ ดิน)

ส่วนงาน : ส่วนงานเครื่องมือทดสอบ

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (g)	MDL	LOQ	Unit	Decimal point	Remark
1	Antimony (Sb)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.05	0.1	mg/l as Sb	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			2.50	5.0	mg/kg as Sb		
2	Arsenic (As)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.05	0.1	mg/l as As	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			2.50	5.00	mg/kg as As		
3	Barium (Ba)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.01	0.02	mg/l as Ba	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			0.50	1.00	mg/kg as Ba		
4	Beryllium (Be)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.01	0.02	mg/l as Be	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			0.50	1.00	mg/kg as Be		
5	Cadmium (Cd)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.01	0.02	mg/l as Cd	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			0.10	0.15	mg/kg as Cd		
6	Chromium (Cr)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.01	0.02	mg/l as Cr	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			0.50	1.00	mg/kg as Cr		
7	Cobalt (Co)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.01	0.02	mg/l as Co	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			0.50	1.00	mg/kg as Co		
8	Copper (Cu)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.01	0.02	mg/l as Cu	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			0.50	1.00	mg/kg as Cu		
9	Hexavalent Chromium (Cr ⁶⁺)	Colorimetric Method/ Spectrophotometer	SW 846 Method 7196A / Spectrophotometer	Plastic	500	0.003	0.050	mg/l as Cr	3	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (g)	MDL	LOQ	Unit	Decimal point	Remark
		Alkaline Digestion,Colorimetric Method/ Spectrophotometer	US EPA SW 846 Method 3060A and 7196A / Spectrophotometer			0.40	2.00	mg/kg as Cr	2	
10	Lead (Pb)	Waste Extraction , ICP-OES Method Digestion,ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.01 0.50	0.02 1.00	mg/l as Pb mg/kg as Pb	2	
11	Mercury (Hg)	Waste Extraction, Cold Vapor Technique-AAS Method	US EPA SW 846 Method 1310A and Standard Method part 3112 B/ AAS	Plastic	500	0.0005	0.0010	mg/l as Hg	4	
12	Molybdenum (Mo)	Waste Extraction , ICP-OES Method Digestion,ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.01 0.50	0.02 1.00	mg/l as Mo mg/kg as Mo	2	
13	Nickel (Ni)	Waste Extraction , ICP-OES Method Digestion,ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.01 0.50	0.02 1.00	mg/l as Ni mg/kg as Ni	2	
14	Selenium (Se)	Waste Extraction , ICP-OES Method Digestion,ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.05 2.50	0.10 5.00	mg/l as Se mg/kg as Se	2	
15	Silver (Ag)	Waste Extraction , ICP-OES Method Digestion,ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.02 1.00	0.05 2.50	mg/l as Ag mg/kg as Ag	2	
16	Thallium (Tl)	Waste Extraction , ICP-OES Method Digestion,ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.05 2.50	0.10 5.00	mg/l as V mg/kg as V	2	
17	Vanadium (V)	Waste Extraction , ICP-OES Method Digestion,ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.01 0.50	0.02 1.00	mg/l as V mg/kg as V	2	
18	Zinc (Zn)	Waste Extraction , ICP-OES Method Digestion,ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.01 0.50	0.02 1.00	mg/l as Zn mg/kg as Zn	2	

การตรวจวิเคราะห์คุณภาพน้ำ – ภาคตะกอน (Water – Solid wastes Quality Analysis)

ตารางที่ 8 สรุปข้อกำหนดการเก็บตัวอย่างและความสามารถในการทดสอบตัวอย่างของห้องปฏิบัติการ ตามที่ขึ้นทะเบียนกับกรมโรงงานอุตสาหกรรม

(ประเภทตัวอย่าง : ดิน)

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (g)	MDL	LOQ	Unit	Decimal point	Remark
1	Arsenic (As)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	2.50	5.00	mg/kg as As	2	
2	Antimony (Sb)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	2.50	5.0	mg/kg as Sb	2	
3	Barium (Ba)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.50	1.0	mg/kg as Ba	2	
4	Beryllium (Be)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.50	1.0	mg/kg as Be	2	
5	Cadmium (Cd)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.10	0.15	mg/kg as Cd	0	
6	Chromium (Cr)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/kg as Cr	2	
7	Hexavalent Chromium (Cr ⁶⁺)	Digestion,Colorimetric Method	US EPA SW 846 Method 3060A and 7196A / Spectrophotometer	Plastic	500	0.40	2.00	mg/kg as Cr	3	
8	Lead (Pb)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/kg as Pb	2	
9	Manganese (Mn)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/kg as Mn	2	
10	Mercury (Hg)	Digestion,Cold Vapor Technique- AAS Method	US EPA SW 846 Method 3050B and 7471B / AAS	Plastic	500	0.10	0.20	mg/kg as Hg	4	
11	Nickel (Ni)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/kg as Ni	2	
12	Selenium (Se)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	2.50	5.00	mg/kg as Se	2	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (g)	MDL	LOQ	Unit	Decimal point	Remark
13	Silver (Ag)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	1.00	2.50	mg/kg as Ag	2	
14	Trivalent Chromium (Cr ³⁺)	Digestion,ICP-OES Method; Filtration,Colorimetric Method;Calculation	US EPA SW 846 Method 3050B and 6010C / ICP-OESUS ; Method 3060A and 7196A / Spectrophotometer	Plastic	500	0.40	2.00	mg/k as Cr	3	
15	Vanadium (V)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/kg as V	2	
16	Zinc (Zn)	Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/kg as Zn	2	
17	Volatile organic compounds;VOC			Glass	50					
1	- Acetone	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
2	- Benzene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
3	- Bromodichloromethane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
4	- Bromoform	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
5	- Butanol	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
7	- Carbon tetrachloride	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
8	- Chlorobenzene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
9	- Chlorodibromomethane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
10	- Chloroform	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (g)	MDL	LOQ	Unit	Decimal point	Remark
11	- 1,2-Dichlorobenzene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
12	- 1,3-Dichlorobenzene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
13	- 1,4-Dichlorobenzene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
14	- 1,1-Dichloroethane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
15	- 1,2-Dichloroethane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
16	- 1,1-Dichloroethylene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
17	- cis-1,2-Dichloroethylene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
18	- trans-1,2-Dichloroethylene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
19	- 1,2-Dichloropropane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
20	- 1,3-Dichloropropane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
21	- Ethylbenzene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
22	- n-Hexane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.010	0.010	mg/kg	3	
23	- Methylene Chloride or Dichloromethane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
24	- Methyl tert-butyl ether	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (g)	MDL	LOQ	Unit	Decimal point	Remark
25	- Naphthalene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
26	- Nitrobenzene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
27	- Styrene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
28	- 1,1,2,2-Tetrachloroethane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
29	- Tetrachloroethylene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
30	- Toluene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
31	- 1,2,4-Trichlorobenzene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
32	- 1,1,1-Trichloroethane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
33	- 1,1,2-Trichloroethane	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
34	- Trichloroethylene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
35	- 1,3,5-Trimethylbenzene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
36	- Vinyl acetate	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
37	- Vinyl Chloride	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
38	- m-Xylene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
39	- o-Xylene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (g)	MDL	LOQ	Unit	Decimal point	Remark
40	- p-Xylene	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
41	- Xylene Total	Purge-and-Trap / GC-MS	US EPA SW 846 Method 5035A and 8260D	Glass	50	0.005	0.010	mg/kg	3	
18	Semivolatile organic compounds #1			Glass	2500					
1	Acenaphthene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
2	Anthracene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
3	Benz[a]anthracene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
4	Benzo[b]fluoranthene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
5	Benzo[k]fluoranthene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
6	Benzo[a]pyrene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
7	Benzo[ghi]perylene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
8	Bis(2-chloroethyl) ether	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
9	Bis(2-ethylhexyl) phthalate	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
10	Butyl benzyl phthalate	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
11	Carbazole	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
12	p-Chloroaniline	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.500	1.250	mg/kg	3	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (g)	MDL	LOQ	Unit	Decimal point	Remark
13	2-Chlorophenol	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
14	Chrysene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
15	Dibenz[a,h]anthracene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
16	Di-n-butyl phthalate	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
17	2,4-Dichlorophenol	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
18	Diethyl Phthalate	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
19	2,4-Dimethylphenol	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
20	2,4-Dinitrotoluene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
21	2,6-Dinitrotoluene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
22	Di-n-octyl phthalate	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
23	Fluoranthene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
24	Fluorene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
25	Hexachlorobenzene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
26	Hexachloro-1,3-butadiene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
27	Hexachlorocyclopentadiene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (g)	MDL	LOQ	Unit	Decimal point	Remark
28	Hexachloroethane	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
29	Indeno[1,2,3-cd]pyrene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
30	Isophorone	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
31	2-Methylphenol (o-Cresol)	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
32	2-Methylnaphthalene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
33	N-Nitrosodi-n-propylamine	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
34	Phenanthrene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
35	Phenol	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
36	Pyrene	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.250	mg/kg	3	
37	2,4,5-Trichlorophenol	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	
38	2,4,6-Trichlorophenol	Ultrasonic Extraction / GC-MS	US EPA SW 846 Method 3550C and 8270E	Glass	2500	0.125	0.500	mg/kg	3	

การตรวจวิเคราะห์คุณภาพน้ำ – กากตะกอน (Water – Solid wastes Quality Analysis)

ตารางที่ 9 สรุปข้อกำหนดการเก็บตัวอย่างและความสามารถในการทดสอบตัวอย่างของห้องปฏิบัติการ ที่ไม่ได้ขึ้นทะเบียนกับกรมโรงงานอุตสาหกรรม

(ประเภทตัวอย่าง : กากตะกอน ตามประกาศเรื่องสิ่งปฏิกูลที่ไม่ใช่แล้ว)

ส่วนงาน : ส่วนงานเครื่องมือทดสอบ

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
1	Aluminium (Al)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.05	0.1	mg/l as Al	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			2.50	5.0	mg/kg as Al	2	
2	Boron (B)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.01	0.0	mg/l as B	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			0.50	1.00	mg/kg as B	0	
3	Calcium (Ca)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.05	0.10	mg/l as Ca	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			25.0	50.0	mg/kg as Ca	1	
4	Iron (Fe)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.02	0.03	mg/l as Fe	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			1.00	1.50	mg/kg as Fe	2	
5	Magnesium (Mg)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.05	0.10	mg/l as Mg	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			25.0	50.0	mg/kg as Mg	1	
6	Manganese (Mn)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.01	0.02	mg/l as Mn	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			0.50	1.00	mg/kg as Mn	2	
7	Potassium (K)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/l as K	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			25.00	50.0	mg/kg as K	2	
8	Silicon (Si)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.02	0.05	mg/l as Si	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			1.00	2.50	mg/kg as Si	2	
9	Sodium (Na)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/l as Na	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			25.0	50.0	mg/kg as Na	1	
10	Strontium (Sr)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.01	0.02	mg/l as Sr	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			0.50	1.00	mg/kg as Sr	2	
11	Tin (Sn)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.05	0.10	mg/l as Sn	2	
12	Titanium (Ti)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.01	0.02	mg/l as Ti	2	

Items	Parameter	Method	Reference Method / Analytical Technique	Container	sample size (ml)	MDL	LOQ	Unit	Decimal point	Remark
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			0.50	1.00	mg/kg as Ti	2	
13	Phosphorus (P)	Waste Extraction , ICP-OES Method	US EPA SW 846 Method 1310A and 6010C / ICP-OES	Plastic	500	0.50	1.00	mg/l as Ti	2	
		Digestion,ICP-OES Method	US EPA SW 846 Method 3050B and 6010C / ICP-OES			25.00	50.0	mg/kg as Ti	2	

เอกสารอ้างอิง

- 1

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