

ภาคผนวก ง

เอกสารการสอบเทียบเครื่องมือตรวจวิเคราะห์



รายการเครื่องใช้ขึ้นการวิเคราะห์ / หมายเหตุ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Ambient	Total Suspended Particulate	High Volume	BKCF50372	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	BKCF50363	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	BKCF50365	-	-	On site Calibration
Ambient	Total Suspended Particulate	Digital Balance	BKCE00004	10-Mar-21	10-Mar-22	12
Ambient	Particulate Matter (PM-10)	High Volume	BKCF51060	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	BKCF50374	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	BKCF50379	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	Digital Balance	BKCE00004	10-Mar-21	10-Mar-22	12
Ambient	Nitrogen Dioxide	NO _x Analyzer	BKCF50803	4-Jan-22	4-Jul-22	6
Ambient	Nitrogen Dioxide	NO _x Analyzer	BKCF50785	4-Jan-22	4-Jul-22	6
Ambient	Nitrogen Dioxide	NO _x Analyzer	BKCF50773	4-Jan-22	4-Jul-22	6
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	BKCF50977	1-Nov-21	2-May-23	18
Ambient	Wind Speed / Wind Direction	RYC FS0436	6-Jan-22	7-Jul-23	18	18
Ambient	Wind Speed / Wind Direction	BKCF50167	11-May-21	9-Nov-22	18	18
Stack	Carbon Monoxide	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Carbon Monoxide	Console Control Unit	BKCF50448	6-Jan-22	6-Jul-22	6
Stack	Carbon Monoxide	Pilot Tube	BKCF50463	6-Jan-22	6-Jul-22	6
Stack	Carbon Monoxide	CO Analyzer	BKCE00073	14-Oct-21	14-Apr-23	18
Stack	Chromium	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Chromium	ICP-OES	BKCE00037	13-Sep-21	12-Mar-23	18
Stack	Oxides of Nitrogen	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Oxides of Nitrogen	Console Control Unit	BKCF50448	6-Jan-22	6-Jul-22	6



รายการเครื่องใช้ขึ้นการวิเคราะห์ / หมายเหตุ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Workplace	Chromium	Field Rotameter	BKCF51013	1-Apr-22	1-Jul-22	3
Workplace	Chromium	ICP-OES	BKCF51037	13-Sep-21	12-Mar-23	18
Workplace	Silica (Quartz)	Field Rotameter	BKCF51022	5-Jan-22	5-Apr-22	3
Workplace	Silica (Quartz)	Field Rotameter	BKCF51013	1-Apr-22	1-Jul-22	3
Noise	Leq 24 hrs	Sound Calibrator	BKCF50617	9-Aug-21	9-Aug-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50879	25-Oct-21	25-Oct-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50927	7-Sep-22	7-Sep-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50923	12-Oct-21	12-Oct-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50926	7-Jul-21	7-Jul-22	12
Noise	Leq 24 hrs	Sound Calibrator	BKCF50617	9-Aug-21	9-Aug-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50880	25-Oct-21	25-Oct-22	12
Noise	Leq 8 hrs	Sound Calibrator	BKCF50630	24-Mar-21	24-Mar-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50993	12-Oct-21	12-Oct-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50994	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50995	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50996	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50998	7-Sep-21	7-Sep-22	12
Noise	Leq 8 hrs	Sound Calibrator	BKCF50617	9-Aug-21	9-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50996	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50970	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50971	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Calibrator	BKCF50617	9-Aug-21	9-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50968	12-Jan-22	12-Jan-23	12



รายการเครื่องใช้ขึ้นการวิเคราะห์ / หมายเหตุ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Stack	Oxides of Nitrogen	Pilot Tube	BKCF50453	6-Jan-22	6-Jul-22	6
Stack	Oxides of Nitrogen	Vacuum Gauge	BKCF50546	10-Nov-21	8-Nov-22	18
Stack	Oxides of Nitrogen	Vacuum Gauge	BKCF50545	23-Dec-20	23-Jun-22	18
Stack	Oxides of Nitrogen	Vacuum Gauge	BKCF50893	26-Nov-20	27-May-22	18
Stack	Oxides of Nitrogen	Spectrophotometer	BKCE00018	15-Oct-21	15-Oct-22	12
Stack	Total Hydrocarbon as Methane	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Total Hydrocarbon as Methane	Pilot Tube	BKCF50463	6-Jan-22	6-Jul-22	6
Stack	Total Hydrocarbon as Methane	FD Analyzer	BKCF50758	4-Jan-22	4-Jul-22	6
Stack	Total VOC as Methane	Pilot Tube	BKCF50463	6-Jan-22	6-Jul-22	6
Stack	Total VOC as Methane	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Total VOC as Methane	FD Analyzer	BKCF50758	4-Jan-22	4-Jul-22	6
Stack	Total Suspended Particulate	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Total Suspended Particulate	Console Control Unit	BKCF50448	6-Jan-22	6-Jul-22	6
Stack	Total Suspended Particulate	Pilot Tube	BKCF50463	6-Jan-22	6-Jul-22	6
Stack	Total Suspended Particulate	Digital Balance	BKCE00049	16-Dec-21	16-Dec-22	12
Workplace	Total Dust	Field Rotameter	BKCF51022	5-Jan-22	5-Apr-22	3
Workplace	Total Dust	Field Rotameter	BKCF51013	1-Apr-22	1-Jul-22	3
Workplace	Total Dust	Digital Balance	BKCE00004	25-Feb-22	25-Feb-23	12
Workplace	Respirable Dust	Field Rotameter	BKCF51022	5-Apr-22	5-Apr-22	3
Workplace	Respirable Dust	Field Rotameter	BKCF51013	1-Apr-22	1-Jul-22	3
Workplace	Respirable Dust	Digital Balance	BKCE00004	25-Feb-22	25-Feb-23	12
Workplace	Chromium	Field Rotameter	BKCF51022	5-Jan-22	5-Apr-22	3



รายการเครื่องใช้ขึ้นการวิเคราะห์ / หมายเหตุ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Noise	Leq 8 hrs	Sound Level Meter	BKCF50969	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50970	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50971	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50993	12-Oct-21	12-Oct-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50994	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50995	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Calibrator	BKCF50633	14-Jan-22	14-Jan-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50998	7-Sep-21	7-Sep-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50999	7-Sep-21	7-Sep-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF51000	7-Sep-21	7-Sep-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50650	12-May-21	12-May-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50673	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50682	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50650	12-May-21	12-May-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50669	7-Jun-21	7-Jun-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50673	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50681	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50682	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50662	17-May-21	17-May-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50680	15-Feb-22	15-Feb-23	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50681	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50662	17-May-21	17-May-22	12



รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Water Lab	pH at 25 °C	pH meter	BKC_EH0072	26-Mar-21	24-Sep-22	18
Water Lab	Oil & Grease	Electronic Top-Loading Balance	BKC_EH0002	25-Feb-22	25-Feb-23	12
Water Lab	Oil & Grease	Water Bath	BKC_EH0148	31-Jan-22	1-Aug-23	18
Water Lab	Total Suspended Solids	Electronic Top-Loading Balance	BKC_EH0002	25-Feb-22	25-Feb-23	12
Water Lab	Total Suspended Solids	Oven	BKC_EH0007	1-Dec-21	1-Jun-23	18
Water Lab	Temperature	pH Meter	BKC_LG0024	25-Nov-21	25-Nov-22	12
Water Lab	BOD (5 days at 20°C)	DO Meter	BKC_EH0017	29-Dec-20	29-Jun-22	18
Water Lab	BOD (5 days at 20°C)	Incubator	BKC_EH0005	4-Oct-21	4-Apr-23	18
Water Lab	COD	Hot Block	BKC_EH0222	21-Mar-22	21-Mar-23	12
Water Lab	COD	Spectrophotometer	BKC_EH0018	15-Oct-21	15-Oct-22	12



รายการเครื่องใช้ขึ้นการวิเคราะห์ / หมายเหตุ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Ambient	Total Suspended Particulate	High Volume	BKCF50372	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	BKCF50363	-	-	On site Calibration
Ambient	Total Suspended Particulate	High Volume	BKCF50365	-	-	On site Calibration
Ambient	Total Suspended Particulate	Digital Balance	BKCEB0004	10-May-21	10-Mar-22	12
Ambient	Particulate Matter (PM-10)	High Volume	BKCF51060	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	BKCF50374	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	High Volume	BKCF50379	-	-	On site Calibration
Ambient	Particulate Matter (PM-10)	Digital Balance	BKCEB0004	10-Mar-21	10-Mar-22	12
Ambient	Nitrogen Dioxide	NO _x Analyzer	BKCF50803	4-Jan-22	4-Jul-22	6
Ambient	Nitrogen Dioxide	NO _x Analyzer	BKCF50785	4-Jan-22	4-Jul-22	6
Ambient	Nitrogen Dioxide	NO _x Analyzer	BKCF50773	4-Jan-22	4-Jul-22	6
Ambient	Wind Speed / Wind Direction	Wind Speed / Wind Direction	BKCF50977	1-Nov-21	2-May-23	18
Ambient	Wind Speed / Wind Direction	RYC FS0436	6-Jan-22	7-Jul-23	18	
Ambient	Wind Speed / Wind Direction	BKCF50167	11-May-21	9-Nov-22	18	
Stack	Carbon Monoxide	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Carbon Monoxide	Console Control Unit	BKCF50448	6-Jan-22	6-Jul-22	6
Stack	Carbon Monoxide	Pilot Tube	BKCF50463	6-Jan-22	6-Jul-22	6
Stack	Carbon Monoxide	CO Analyzer	BKCEB0073	14-Oct-21	14-Apr-23	18
Stack	Chromium	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Chromium	ICP-OES	BKCEB0087	13-Sep-21	12-Mar-23	18
Stack	Oxides of Nitrogen	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Oxides of Nitrogen	Console Control Unit	BKCF50448	6-Jan-22	6-Jul-22	6



รายการเครื่องใช้ขึ้นการวิเคราะห์ / หมายเหตุ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Workplace	Chromium	Field Rotameter	BKCF51013	1-Apr-22	1-Jul-22	3
Workplace	Chromium	ICP-OES	BKCF51037	13-Sep-21	12-Mar-23	18
Workplace	Silica (Quartz)	Field Rotameter	BKCF51022	5-Jan-22	5-Apr-22	3
Workplace	Silica (Quartz)	Field Rotameter	BKCF51013	1-Apr-22	1-Jul-22	3
Noise	Leq 24 hrs	Sound Calibrator	BKCF50617	9-Aug-21	9-Aug-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50879	25-Oct-21	25-Oct-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50927	7-Sep-22	7-Sep-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50923	12-Oct-21	12-Oct-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50926	7-Jul-21	7-Jul-22	12
Noise	Leq 24 hrs	Sound Calibrator	BKCF50617	9-Aug-21	9-Aug-22	12
Noise	Leq 24 hrs	Sound Level Meter	BKCF50880	25-Oct-21	25-Oct-22	12
Noise	Leq 8 hrs	Sound Calibrator	BKCF50630	24-Mar-21	24-Mar-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50993	12-Oct-21	12-Oct-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50994	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50995	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50996	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50998	7-Sep-21	7-Sep-22	12
Noise	Leq 8 hrs	Sound Calibrator	BKCF50617	9-Aug-21	9-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50996	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50970	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50971	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Calibrator	BKCF50617	9-Aug-21	9-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50968	12-Jan-22	12-Jan-23	12



รายการเครื่องใช้ขึ้นการวิเคราะห์ / หมายเหตุ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Stack	Oxides of Nitrogen	Pilot Tube	BKCF50453	6-Jan-22	6-Jul-22	6
Stack	Oxides of Nitrogen	Vacuum Gauge	BKCF50546	10-Nov-21	8-Nov-22	18
Stack	Oxides of Nitrogen	Vacuum Gauge	BKCF50545	23-Dec-20	23-Jun-22	18
Stack	Oxides of Nitrogen	Vacuum Gauge	BKCF50893	26-Nov-20	27-May-22	18
Stack	Oxides of Nitrogen	Spectrophotometer	BKCEB00018	15-Oct-21	15-Oct-22	12
Stack	Total Hydrocarbon as Methane	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Total Hydrocarbon as Methane	Pilot Tube	BKCF50463	6-Jan-22	6-Jul-22	6
Stack	Total Hydrocarbon as Methane	FD Analyzer	BKCF50758	4-Jan-22	4-Jul-22	6
Stack	Total VOC as Methane	Pilot Tube	BKCF50463	6-Jan-22	6-Jul-22	6
Stack	Total VOC as Methane	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Total VOC as Methane	FD Analyzer	BKCF50758	4-Jan-22	4-Jul-22	6
Stack	Total Suspended Particulate	Console Control Unit	BKCF50547	11-Jan-22	11-Jul-22	6
Stack	Total Suspended Particulate	Console Control Unit	BKCF50448	6-Jan-22	6-Jul-22	6
Stack	Total Suspended Particulate	Pilot Tube	BKCF50463	6-Jan-22	6-Jul-22	6
Stack	Total Suspended Particulate	Digital Balance	BKCEB0049	16-Dec-21	16-Dec-22	12
Workplace	Total Dust	Field Rotameter	BKCF51022	5-Jan-22	5-Apr-22	3
Workplace	Total Dust	Field Rotameter	BKCF51013	1-Apr-22	1-Jul-22	3
Workplace	Total Dust	Digital Balance	BKCEB0004	25-Feb-22	25-Feb-23	12
Workplace	Respirable Dust	Field Rotameter	BKCF51022	5-Apr-22	5-Apr-22	3
Workplace	Respirable Dust	Field Rotameter	BKCF51013	1-Apr-22	1-Jul-22	3
Workplace	Respirable Dust	Digital Balance	BKCEB0004	25-Feb-22	25-Feb-23	12
Workplace	Chromium	Field Rotameter	BKCF51022	5-Jan-22	5-Apr-22	3



รายการเครื่องใช้ขึ้นการวิเคราะห์ / หมายเหตุ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Noise	Leq 8 hrs	Sound Level Meter	BKCF50969	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50970	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50971	12-Jan-22	12-Jan-23	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50993	12-Oct-21	12-Oct-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50994	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50995	6-Aug-21	6-Aug-22	12
Noise	Leq 8 hrs	Sound Calibrator	BKCF50633	14-Jan-22	14-Jan-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50998	7-Sep-21	7-Sep-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF50999	7-Sep-21	7-Sep-22	12
Noise	Leq 8 hrs	Sound Level Meter	BKCF51000	7-Sep-21	7-Sep-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50650	12-May-21	12-May-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50673	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50682	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50650	12-May-21	12-May-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50669	7-Jun-21	7-Jun-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50673	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50681	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50682	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50662	17-May-21	17-May-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50680	15-Feb-22	15-Feb-23	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50681	1-Oct-21	1-Oct-22	12
Heat	Heat Stress	Heat Stress Monitor	BKCF50662	17-May-21	17-May-22	12



รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ทดสอบ

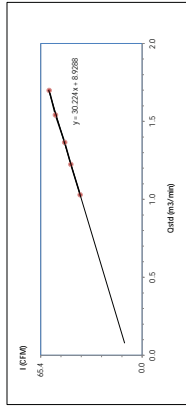
Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Water Lab	pH at 25 °C	pH meter	BKC_EH0072	26-Mar-21	24-Sep-22	18
Water Lab	Oil & Grease	Electronic Top-Loading Balance	BKC_EH0002	25-Feb-22	25-Feb-23	12
Water Lab	Oil & Grease	Water Bath	BKC_EH0148	31-Jan-22	1-Aug-23	18
Water Lab	Total Suspended Solids	Electronic Top-Loading Balance	BKC_EH0002	25-Feb-22	25-Feb-23	12
Water Lab	Total Suspended Solids	Oven	BKC_EH0007	1-Dec-21	1-Jun-23	18
Water Lab	Temperature	pH Meter	BKC_LG0024	25-Nov-21	25-Nov-22	12
Water Lab	BOD (5 days at 20°C)	DO Meter	BKC_EH0017	29-Dec-20	29-Jun-22	18
Water Lab	BOD (5 days at 20°C)	Incubator	BKC_EH0005	4-Oct-21	4-Apr-23	18
Water Lab	COD	Hot Block	BKC_EH0222	21-Mar-22	21-Mar-23	12
Water Lab	COD	Spectrophotometer	BKC_EH0018	15-Oct-21	15-Oct-22	12



High Volume Air Sampler Calibration Worksheet

Project Site:	Magnolia Co., Ltd.	Barometric Pressure (mm Hg):	759
Calibration Location:	Sarabhai (A3)	Temperature (°C):	33
Calibration Date:	14 Jan 22	High Volume ID:	BKX 53072
Calibration Sheet No.:	C-14012-BKX 53072	High Volume Model:	TE 5009K
Calibrator ID:	BKX 53024	High Volume S/N:	5332
Calibrator Model:	TE 5028A	Calibrator Slope:	1.6942
Calibrator S/N:	2884	Calibrator Intercept:	-0.02902

Test No.	Delta H ₂ O (mm)	Q _{vol} (m ³ /min)	1 Chart (CFM)	Linear Regression
1	2.8	1.0295	40	Slope: 30.2226
2	4.0	1.2448	46	Intercept: 8.9288
3	5.0	1.3660	50	Correlation Coefficient: 0.9903
4	6.4	1.5416	56	
5	7.8	1.6989	60	



Calibrated by: Winyon B (Mr. Winyon Boonwala) Field Scientist(I)
Approved by: Winyon B (Mr. Winyon Boonwala) Manager

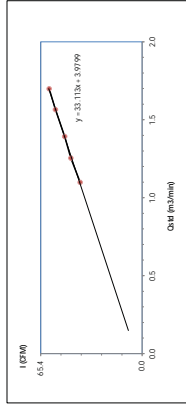
FORMING F04-073 REVISION NO.: ISSUE DATE: 14/01/16



High Volume Air Sampler Calibration Worksheet

Project Site:	Magnolia Co., Ltd.	Barometric Pressure (mm Hg):	759
Calibration Location:	Sarabhai (A3)	Temperature (°C):	33
Calibration Date:	14 Jan 22	High Volume ID:	BKX 53023
Calibration Sheet No.:	C-14012-BKX 53023	High Volume Model:	TE 5009K
Calibrator ID:	BKX 53024	High Volume S/N:	4150
Calibrator Model:	TE 5028A	Calibrator Slope:	1.6942
Calibrator S/N:	2884	Calibrator Intercept:	-0.02902

Test No.	Delta H ₂ O (mm)	Q _{vol} (m ³ /min)	1 Chart (CFM)	Linear Regression
1	3.2	1.0986	40	Slope: 33.1133
2	4.2	1.2543	46	Intercept: 3.9799
3	5.2	1.3924	50	Correlation Coefficient: 0.9991
4	6.6	1.5603	56	
5	7.8	1.6989	60	



Calibrated by: Winyon B (Mr. Winyon Boonwala) Field Scientist(I)
Approved by: Winyon B (Mr. Winyon Boonwala) Manager

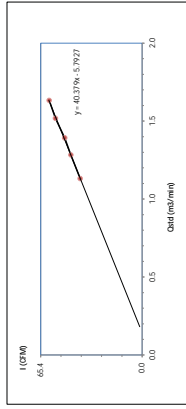
FORMING F04-073 REVISION NO.: ISSUE DATE: 14/01/16



High Volume Air Sampler Calibration Worksheet

Project Site:	Magnolia Co., Ltd.	Barometric Pressure (mm Hg):	759
Calibration Location:	Sarabhai (A3)	Temperature (°C):	33
Calibration Date:	14 Jan 22	High Volume ID:	BKX 53035
Calibration Sheet No.:	C-14012-BKX 53035	High Volume Model:	TE 5009K
Calibrator ID:	BKX 53024	High Volume S/N:	4164
Calibrator Model:	TE 5028A	Calibrator Slope:	1.6942
Calibrator S/N:	2884	Calibrator Intercept:	-0.02902

Test No.	Delta H ₂ O (mm)	Q _{vol} (m ³ /min)	1 Chart (CFM)	Linear Regression
1	3.4	1.1315	40	Slope: 40.3785
2	4.4	1.2832	46	Intercept: -5.7927
3	5.2	1.3924	50	Correlation Coefficient: 0.9900
4	6.2	1.5178	56	
5	7.2	1.6333	60	



Calibrated by: Winyon B (Mr. Winyon Boonwala) Field Scientist(I)
Approved by: Winyon B (Mr. Winyon Boonwala) Manager

FORMING F04-073 REVISION NO.: ISSUE DATE: 14/01/16

High Volume Air Sampler Calibration Worksheet

Project Site: Magnolia Co., Ltd. Barometric Pressure (mm Hg): 759

Calibration Location: Sarabhai (A3) Temperature (°C): 33

Calibration Date: 14 Jan 22 High Volume ID: BKX 53072

Calibration Sheet No.: C-14012-BKX 53072 High Volume Model: TE 5009K

Calibrator ID: BKX 53024 High Volume S/N: 5332

Calibrator Model: TE 5028A Calibrator Slope: 1.6942

Calibrator S/N: 2884 Calibrator Intercept: -0.02902

1 Chart (CFM)

Qvol (m³/min)

Linear Regression

Slope: 30.2226

Intercept: 8.9288

Correlation Coefficient: 0.9903

Calibrated by: Winyon B (Mr. Winyon Boonwala) Field Scientist(I)

Approved by: Winyon B (Mr. Winyon Boonwala) Manager

FORMING F04-073 REVISION NO.: ISSUE DATE: 14/01/16

High Volume Air Sampler Calibration Worksheet

Project Site: Magnolia Co., Ltd. Barometric Pressure (mm Hg): 759

Calibration Location: Sarabhai (A3) Temperature (°C): 33

Calibration Date: 14 Jan 22 High Volume ID: BKX 53023

Calibration Sheet No.: C-14012-BKX 53023 High Volume Model: TE 5009K

Calibrator ID: BKX 53024 High Volume S/N: 4150

Calibrator Model: TE 5028A Calibrator Slope: 1.6942

Calibrator S/N: 2884 Calibrator Intercept: -0.02902

1 Chart (CFM)

Qvol (m³/min)

Linear Regression

Slope: 33.1133

Intercept: 3.9799

Correlation Coefficient: 0.9991

Calibrated by: Winyon B (Mr. Winyon Boonwala) Field Scientist(I)

Approved by: Winyon B (Mr. Winyon Boonwala) Manager

FORMING F04-073 REVISION NO.: ISSUE DATE: 14/01/16

High Volume Air Sampler Calibration Worksheet

Project Site: Magnolia Co., Ltd. Barometric Pressure (mm Hg): 759

Calibration Location: Sarabhai (A3) Temperature (°C): 33

Calibration Date: 14 Jan 22 High Volume ID: BKX 53035

Calibration Sheet No.: C-14012-BKX 53035 High Volume Model: TE 5009K

Calibrator ID: BKX 53024 High Volume S/N: 4164

Calibrator Model: TE 5028A Calibrator Slope: 1.6942

Calibrator S/N: 2884 Calibrator Intercept: -0.02902

1 Chart (CFM)

Qvol (m³/min)

Linear Regression

Slope: 40.3785

Intercept: -5.7927

Correlation Coefficient: 0.9900

Calibrated by: Winyon B (Mr. Winyon Boonwala) Field Scientist(I)

Approved by: Winyon B (Mr. Winyon Boonwala) Manager

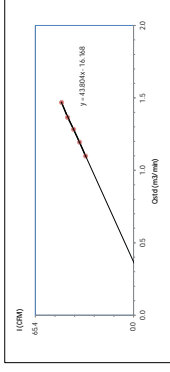
FORMING F04-073 REVISION NO.: ISSUE DATE: 14/01/16



High Volume Air Sampler Calibration Worksheet

Project Site :	Magnesium Co. Ltd.	Barometric Pressure (mm Hg) :	759
Calibrate Location :	Spenthu (A3)	Temperature (°C) :	33
Calibrate Date :	14-Jun-22	High Volume ID :	BK6-F50379
Calibration Sheet No. :	C-140122-BK6-F50379	High Volume Model :	TE-5009X
Calibrator ID :	BK6-F50374	High Volume S/N :	5195
Calibrator Model :	TE-5020A	Calibrator Slope :	1.6462
Calibrator S/N :	2584	Calibrator Intercept :	-0.02902

Test No.	Delta (C) (ppm)	Q _{std} (ppm)	1 Chart (ppm)	Linear Regression
1	3.2	1.0986	32	Slope: 43.8042
2	3.8	1.1945	36	Intercept: -1.61975
3	4.4	1.2832	40	Correlation Coefficient: 0.9995
4	5.0	1.3663	44	
5	5.6	1.4493	48	



Calibrated By: *Wayan B*
Approved By: *Mark Chandra*
(Mr. Wayan Chandra)
Field Scientist (1)
Manager

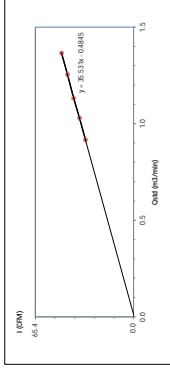
FORM NO. F 56-09, REVISION NO. 1, ISSUE DATE 14/03/16



High Volume Air Sampler Calibration Worksheet

Project Site :	Magnesium Co. Ltd.	Barometric Pressure (mm Hg) :	759
Calibrate Location :	Spenthu (A3)	Temperature (°C) :	33
Calibrate Date :	14-Jun-22	High Volume ID :	BK6-F50374
Calibration Sheet No. :	C-140122-BK6-F50374	High Volume Model :	TE-5009X
Calibrator ID :	BK6-F50374	High Volume S/N :	5195
Calibrator Model :	TE-5020A	Calibrator Slope :	1.6462
Calibrator S/N :	2584	Calibrator Intercept :	-0.02902

Test No.	Delta (C) (ppm)	Q _{std} (ppm)	1 Chart (ppm)	Linear Regression
1	2.2	0.9168	32	Slope: 33.5206
2	2.8	1.0296	36	Intercept: -0.1645
3	3.4	1.1315	40	Correlation Coefficient: 0.9997
4	4.2	1.2543	44	
5	5.0	1.3560	48	



Calibrated By: *Wayan B*
Approved By: *Mark Chandra*
(Mr. Wayan Chandra)
Field Scientist (1)
Manager

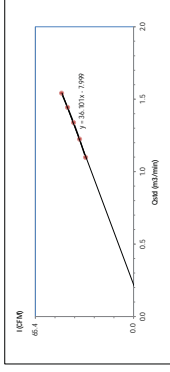
FORM NO. F 56-09, REVISION NO. 1, ISSUE DATE 14/03/16



High Volume Air Sampler Calibration Worksheet

Project Site :	Magnesium Co. Ltd.	Barometric Pressure (mm Hg) :	759
Calibrate Location :	Spenthu (A3)	Temperature (°C) :	33
Calibrate Date :	14-Jun-22	High Volume ID :	BK6-F51000
Calibration Sheet No. :	C-140122-BK6-F51000	High Volume Model :	TE-5009X
Calibrator ID :	BK6-F50374	High Volume S/N :	5053
Calibrator Model :	TE-5020A	Calibrator Slope :	1.6462
Calibrator S/N :	2584	Calibrator Intercept :	-0.02902

Test No.	Delta (C) (ppm)	Q _{std} (ppm)	1 Chart (ppm)	Linear Regression
1	3.2	1.0986	32	Slope: 38.1072
2	4.0	1.2248	36	Intercept: -2.7990
3	4.8	1.3389	40	Correlation Coefficient: 0.9997
4	5.6	1.4439	44	
5	6.4	1.5476	48	



Calibrated By: *Wayan B*
Approved By: *Mark Chandra*
(Mr. Wayan Chandra)
Field Scientist (1)
Manager

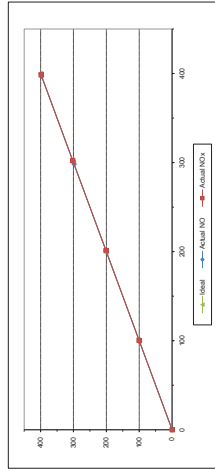
FORM NO. F 56-09, REVISION NO. 1, ISSUE DATE 14/03/16



MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jun-22	Equipment Name	NOx Analyzer
Manufacturer	HORIBA	Model	APNA-37D
Serial No.	2000	Equipment ID	BK6-F50379
Calibrator Manufacturer	TECHSYNE API	Model	710
Serial No.	947		
Std. Gas Concentration (PPM)	61.35	Cylinder No.	LL36853
Cylinder Pressure (psi)	1200	Certified By	Algas Inc.
Certified Date	15-Mar-14	Expired Date	15-Mar-22

Point	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10
1	100.00	99.80	-1.20	-1.20	100.50	0.50
2	200.00	201.50	1.50	0.75	201.20	0.60
3	300.00	298.40	-1.60	-0.53	302.30	0.77
4	400.00	398.90	-1.10	-0.28	398.30	-0.38
AVERAGE (%)			-0.38			0.32



Calibrated By: *Wayan B*
Approved By: *Mark Chandra*
(Mr. Wayan Chandra)
Field Environmental Scientist (3)
Assistant General Manager

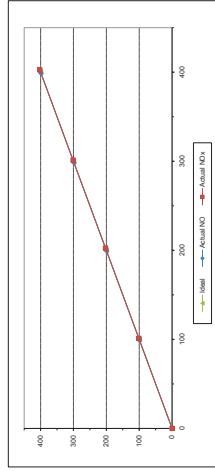
FORM NO. F 56-09, REVISION NO. 1, ISSUE DATE 02/04/12



MULTIPOINT CALIBRATION REPORT

Calibration Date	4-Jun-22	Equipment Name	NOx Analyzer
Manufacturer	TECHSYNE API	Model	200E
Serial No.	4576	Equipment ID	BK6-F50379
Calibrator Manufacturer	TECHSYNE API	Model	710
Serial No.	947		
Std. Gas Concentration (PPM)	61.35	Cylinder No.	LL36853
Cylinder Pressure (psi)	1200	Certified By	Algas Inc.
Certified Date	15-Mar-14	Expired Date	15-Mar-22

Point	Ideal	Actual NO	Error NO	%Error NO	Actual NOx	%Error NOx
ZERO	0.00	0.10	0.10	0.10	0.10	0.10
1	100.00	99.10	-0.90	-0.90	101.20	1.20
2	200.00	199.50	-0.50	-0.25	202.60	2.60
3	300.00	298.20	-1.80	-0.60	301.30	0.43
4	400.00	398.70	-1.30	-0.33	402.60	2.60
AVERAGE (%)			-0.40			0.74



Calibrated By: *Wayan B*
Approved By: *Mark Chandra*
(Mr. Wayan Chandra)
Field Environmental Scientist (3)
Assistant General Manager

FORM NO. F 56-09, REVISION NO. 1, ISSUE DATE 02/04/12

CERTIFICATE OF CALIBRATION

Page 1 of 4 pages

Measurement Item: 1000 g weight

Standard: 1000 g weight

Method: 1000 g weight

Range: 1000 g weight

Unit: 1000 g weight

Calibration: 1000 g weight

Uncertainty: 1000 g weight

Remarks: 1000 g weight

Signature: 1000 g weight

Date: 1000 g weight

Signature: 1000 g weight

Date: 1000 g weight

Signature: 1000 g weight

Date: 1000 g weight

Signature: 1000 g weight

Date: 1000 g weight

CERTIFICATE OF CALIBRATION

Page 2 of 4 pages

Measurement Item: 1000 g weight

Standard: 1000 g weight

Method: 1000 g weight

Range: 1000 g weight

Unit: 1000 g weight

Calibration: 1000 g weight

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CERTIFICATE OF CALIBRATION

Page 3 of 4 pages

Measurement Item: 1000 g weight

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CERTIFICATE OF CALIBRATION

Page 4 of 4 pages

Measurement Item: 1000 g weight

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CERTIFICATE OF CALIBRATION

Page 2 of 4 pages

Measurement Item: 1000 g weight

Standard: 1000 g weight

Method: 1000 g weight

Range: 1000 g weight

Unit: 1000 g weight

Calibration: 1000 g weight

Uncertainty: 1000 g weight

Remarks: 1000 g weight

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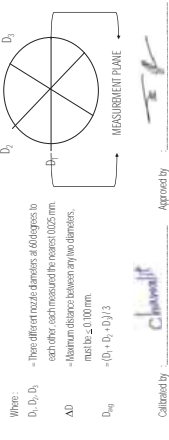
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PROBE NOZZLE DIAMETER
CALIBRATION DATA SHEET

Calibration Date	11 Jan 22	Nozzle Set ID	BKCF5563			
Calibration Sheet No.	C-11022-BKCF5563	Vermel Capet ID	BKCF55626			
Nozzle ID #	Nozzle Diameter (cm)			HI - LO	AD	D _{avg}
	D ₁	D ₂	D ₃			
1	0.310	0.310	0.310	0.000	0.000	0.310
2	0.450	0.450	0.450	0.000	0.000	0.450
3	0.635	0.635	0.635	0.000	0.000	0.635
4	0.790	0.790	0.790	0.000	0.000	0.790
5	0.950	0.950	0.950	0.000	0.000	0.950
6	1.110	1.110	1.110	0.000	0.000	1.110
7	1.270	1.270	1.270	0.000	0.000	1.270



Stopwatch Calibration Test Report

Calibration Date: 6 Jan 22
New Cal. Date: 6 Jan 22
Barometric Pressure (mmHg): 758
Temperature (°C): 32.0
Relative Humidity (%): 66.0

Reference Stopwatch Data
Stopwatch ID No.: E18061
Dry Gas Meter No.: BKCF55048
Model: XC572-V
Serial No.: 1901983
Calibration Date: 8 Sep 20
Certificate No.: E-2009018

Run No.	Time Actual (seconds)	Time Reading (secs)	Diff. (sec)	Diff. (mm)
1	5.0011	5.00	11	0.00018
2	5.0011	5.00	11	0.00018
3	5.0012	5.00	12	0.00020
4	5.0010	5.00	10	0.00017
5	5.0010	5.00	10	0.00017
6	5.0011	5.00	11	0.00018
7	5.0010	5.00	10	0.00017
8	5.0012	5.00	12	0.00020
9	5.0012	5.00	12	0.00020
10	5.0011	5.00	11	0.00018
Average			11	0.00018
SD				0.00001

Calibrated by: M. Sami Rorongan
Specialist (1)

Approved by: M. Sami Rorongan
Specialist (1)

AH		e		θ		φ		ψ		ω		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η		τ		ι		θ		ρ		σ		λ		μ		ν		ξ		ζ		η	
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PROBE NOZZLE DIAMETER
CALIBRATION DATA SHEET

Calibration Date	6 Jan 22	Nozzle Set ID	BKK-ES0454
Calibration Sheet No.	C-060122-BKK-ES0454	Verma Copter ID	BKK-ES0626
Nozzle Diameter (mm)			
Nozzle ID #	D ₁	D ₂	D ₃
1	0.315	0.315	0.315
2	0.475	0.475	0.475
3	0.635	0.635	0.635
4	0.790	0.790	0.790
5	0.950	0.950	0.950
6	1.110	1.110	1.110
7	1.270	1.270	1.270
8	1.600	1.600	1.600



Calibrated by: Nelson S (M. Niranjan Salgurun) Field Specialist (1)
Approved by: [Signature] (M. Smart Boorgan) Field Specialist (1)

FORM 19-01, REVISED 06-05-2010

BKK-EL-0037

Agent Certified Compliance Services

Certificate of System Qualification

65-002

System ID	MP1000000
Organization Name	ALS Laboratory Group (Thailand) Co., Ltd.
Organization Location	101 Prachinburi of Phrasarakkha Rd., Bangkok 10000
Date	September 13, 2021 10:11 PM
MP Name	Agent Certified Compliance
MP Number	65-002-001
Overall Calibration Status	Pass

Preparation	
Parts	
Instrument Type	
Part	
Accessories/Signature	

APPROVED BY: [Signature]
MKT CAL. SHEET 25, Pgs. 20

Date: September 13, 2021 10:11 PM
System ID: MP1000000

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Pilot Tube Calibration Data

Pilot Tube Identification Number: BKK-ES0453
Lab/duct Number: 258-113-01
Calibration Sheet No.: C-060122-BKK-ES0453

Calibration Date: 6 Jan 22
Standard/Part ID: BKK-ES0441
Cp Standard: 0.99

Type-S Pilot Tube Coefficient Data					
Test	Type-S Pilot Tube Log A/B	Standard Pilot Tube Log A/B	Type-S Pilot Tube Log A/B	Cp (s)	Cp (s)
Test 1					
A	12.00	16.60	16.60	0.942	-
B	12.00	16.60	16.60	-	0.942
Test 2					
A	12.00	16.60	16.60	0.942	-
B	12.00	16.60	16.60	-	0.942
Test 3					
A	12.00	16.60	16.60	0.942	-
B	12.00	16.60	16.60	-	0.942

$$Cp(s) = Cp_{avg} \sqrt{\frac{\Delta P_{std}}{\Delta P}} \quad \text{must BE } \leq 0.01$$
$$Cp(s) = Cp_{avg} \sqrt{\frac{\Delta P_{std}}{\Delta P}} \quad \text{must BE } \leq 0.01$$
$$\text{Average deviation (A or B)} = \frac{\sum [Cp(s) - Cp(s) \text{ or } B]}{3} \quad \text{must BE } \leq 0.01$$

Calibrated by: Nelson S (M. Niranjan Salgurun) Field Specialist (1)
Approved by: [Signature] (M. Smart Boorgan) Field Specialist (1)

FORM 19-01, REVISED 06-05-2010

Agent Certified Compliance Services

MULTIPOINT CALIBRATION REPORT

APPROVED BY: [Signature]
MKT CAL. SHEET 25, Pgs. 15

CUSTOMER NAME	ALS Laboratory Group (Thailand) Co., Ltd.
EQUIPMENT NAME	CO Analyzer
MANUFACTURER	TECHNICAL
MODEL	1200
STANDARD GAS CONCENTRATION (PPM)	100.0
CYLINDER NO.	CC20002
CERTIFIED DATE	Nov 05, 2020
EXPIRED DATE	Nov 05, 2028

CERTIFIED BY: ANGAS SPECIALTY GASES

CALIBRATION RESULTS

POINT NO.	ACTUAL CO (PPM)	SENSOR CO (PPM)	% ERROR CO
ZERO	0.00	0.00	-
1	50.00	50.20	0.20
2	90.00	90.10	0.11
3	400.00	399.50	-0.10
4	800.00	800.70	0.10
AVERAGE (%)			0.20

Calibrated by: [Signature] (M. Niranjan Salgurun) Field Specialist (1)
Approved by: [Signature] (M. Smart Boorgan) Field Specialist (1)

DATE: 14 Sep 2024

FORM 19-01, REVISED 06-05-2010

Agent Certified Compliance Services

Electronic Signature

Purpose: This signature page was created and published because the ACE sign-off action was executed, which is valid for the entire document, including attachments. The ACE sign-off is an electronic signature that requires two distinct identification components: unique username and personal password. The Agent representative who has delivered this service understands the meaning and legal status of an electronic signature. As a bonded official operator, the Agent representative has a unique password and login to access ACE and validate signed documents. The Agent representative's name and signature can be applied to this document using a Document Content Management or other suitable method defined by your data source or in current procedures.

Details:

Full Name of Signer: Kanyakorn Subparitakorn
Logged On User Name: kanyakorn.subparitakorn@agent.com
Signature Creation Date: September 13, 2021
Reason for Signature: Enabled protocol and published this original version of document

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Date: September 13, 2021 10:11 PM
System ID: MP1000000

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Preparation

Purpose
This test records a status for each preparation task for the Agilent ICP-OES.

Configuration Details	Results	Criteria	Observed Result	Expected Result	Status
Model/Serial No.:					
Q015A					
<p>Does the plasma ignite successfully in the first three attempts?</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/> Pass <input type="checkbox"/></p>					
<p>Does the detector calibration performed and completed successfully?</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/> Pass <input type="checkbox"/></p>					
<p>Does the instrument calibration performed and completed successfully?</p> <p>Yes <input type="checkbox"/> No <input type="checkbox"/> Pass <input type="checkbox"/></p>					

Instrument Tests

Purpose
This test records a status for each of the automated tests within the Agilent ICP-OES CDS. For detailed test criteria, refer to the attached report.

Configuration Details	Configuration No.	Category	Observed Result	Expected Result	Status
Are the Functional Tests results within acceptance criteria?	M04010010-02	Subsystem Communications	Yes	Yes	Pass
			No	No	Pass
			Yes	Yes	Pass
			No	No	Pass
			Yes	Yes	Pass
			No	No	Pass
			Yes	Yes	Pass
			No	No	Pass
			Yes	Yes	Pass
			No	No	Pass
Are the Instrument Performance Tests results within acceptance criteria?		Yes	Yes	Pass	
		No	No	Pass	
		Yes	Yes	Pass	
		No	No	Pass	
		Yes	Yes	Pass	
Overall Test Status		Pass			

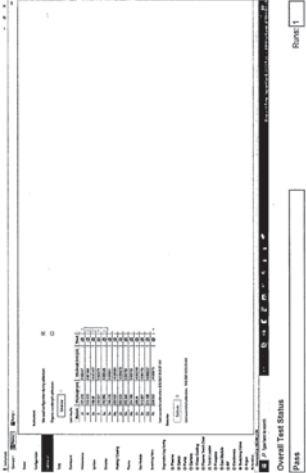
Protocol Details

Purpose
This section lists the revisions for all test units used in this report. For complete test-specific and high-level change details, refer to the Revision History document.

Test Revision	Test
ES 02.50	Autosampler Operation
ES 02.50	Instrument Tests
ES 02.50	Preparation

Was the instrument calibration performed and completed successfully?

Was the instrument calibration performed and completed successfully?
September 8, 2021 9:33:30 AM



Instrument Details

Purpose
This section describes the as found system configuration.

Details	
Bochovenstein 1	Agilent Technologies
Manufacturer:	
Name:	8100 SV02V
Model Number:	G8015A
Sample Introduction:	Double pass glass cyclonic sprayplasma and isotopary nebulizer
Serial Number:	MF16510005
Firmware Revision:	5305
Other 1:	Agilent Technologies
Manufacturer:	
Name:	Other Unspecified
Other Unspecified Name:	Chiller
Model Number:	Other Unspecified
Other Unspecified Model Number:	G2320-80201
Serial Number:	2008-02189
Subsampler 1:	Agilent Technologies
Manufacturer:	
Name:	SP-84
Model Number:	G8415A
Serial Number:	AU15402756
Switching Valve Assembly 1:	Agilent Technologies
Manufacturer:	
Name:	SVS 2+
Model Number:	G4455A
Serial Number:	AU15060115

Was the detector calibration performed and completed successfully?



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Autosampler Operation

Purpose

This test verifies that the autosampler operates properly.

Configuration Details

Model/Serial No.: 08415A J4175440734

Results

Criteria	Observed Result	Expected Result	Status
Does the autosampler successfully move to the specified location(s)?	<div>Yes</div>	<div>Yes</div>	<div>Pass</div>

Overall Test Status

Pass

Fail

Date: September 13, 2021 5:05:41 PM

System ID: MY16010005

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Date: September 13, 2021 5:05:41 PM

System ID: MY16010005

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Attachments

Location	Category	Document Name	Page
ECR	General	Certificate of Qualification for ACE	1
ECR	General	Certificate of Qualification for ACE	1
ECR	General	Operator's training certificate and qualifications	1
ECR	Material	Certificate of Analysis Waters/Agilent calibration solution	4
ECR	General	General	1
ECR	General	Instrument's Test Report	5
ECR	General	Instrument's Test Report	4

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System ID: MY16010005

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Autosampler Operation

Purpose

This test verifies that the autosampler operates properly.

Configuration Details

Model/Serial No.: 08415A J4175440734

Results

Criteria	Observed Result	Expected Result	Status
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Overall Test Status

Pass

Fail

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System ID: MY16010005

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ECR	General	General	1
ECR	General	Instrument's Test Report	5
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Autosampler Operation

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Results

Criteria	Observed Result	Expected Result	Status
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Overall Test Status

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Fail

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ECR	General	Instrument's Test Report	4

Date: September 13, 2021 5:05:41 PM

System ID: MY16010005

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CALIBRATION REPORT

Calibration Date
Equipment Name
Model
Std. Cal. Conc. (ppm)
Certified Date

4-Jun-22
FID Analyzer
9000A
193
17-Sep-14

Equipment ID
Manufacturer
Serial No.
Cylinder No.
Expiry Date

BNC F30789
Baseline Moon
031HEP0047
D319622
17-Sep-22

CALIBRATION RESULTS

Point		CALIBRATION RESULTS			
		Isol	Actual	Error	%Error
ZERO SPAN	193.00	193.00	192.50	-0.50	-0.10
					-0.08

AVERAGE (%)

The graph displays a single data point for the calibration. The Y-axis represents the 'Isol' value, ranging from 0 to 200. The X-axis represents the 'Actual' value, also ranging from 0 to 200. A single data point is plotted at (193, 192.5), showing a very slight deviation from the ideal 1:1 line.

Calibrated By

Approved By

(Mr. Ajit Shinde)

(Mr. Samarth Illangudi)
Assistant General Manager

Field Environmental Scientist (4)

ALS Laboratory Group

[illegible]



ROTA METER CALIBRATION RESULT JANUARY 2022

Rotameter ID	Calibration Date	Regression Result	Coefficient (R ²)
BKK-FS0777	05-Jan-22	$Y = 0.9899x + 0.9112$	0.9999
BKK-FS0779	05-Jan-22	$Y = 1.0071 \times 0.9299$	1.0000
BKK-FS0783	05-Jan-22	$Y = 1.0513x + 1.869$	0.9997
BKK-FS0904	05-Jan-22	$Y = 1.0043x + 1.969$	1.0000
BKK-FS0905	05-Jan-22	$Y = 1.0076x + 1.026$	0.9999
BKK-FS0906	05-Jan-22	$Y = 0.9993x + 3.2655$	1.0000
BKK-FS0907	05-Jan-22	$Y = 0.9491x + 1.457$	0.9996
BKK-FS0908	05-Jan-22	$Y = 1.0154x + 4.8537$	0.9999
BKK-FS0909	05-Jan-22	$Y = 0.9975x + 4.8609$	0.9999
BKK-FS0910	05-Jan-22	$Y = 0.9811x + 10.07$	0.9995
BKK-FS0911	05-Jan-22	$Y = 1.0171x + 92.415$	0.9995
BKK-FS0912	05-Jan-22	$Y = 1.0031x + 98.305$	0.9996
BKK-FS0913	05-Jan-22	$Y = 1.0073x + 7.0629$	0.9999
BKK-FS0914	05-Jan-22	$Y = 1.0248x + 98.162$	0.9999
BKK-FS0915	05-Jan-22	$Y = 1.0248x + 26.806$	0.9991
BKK-FS0916	05-Jan-22	$Y = 1.0253x + 122.14$	0.9999
BKK-FS0917	05-Jan-22	$Y = 0.9951x + 19.648$	0.9999
BKK-FS0918	05-Jan-22	$Y = 1.0096x + 4.6643$	0.9997
BKK-FS1005	04-Jan-22	$Y = 1.2188x + 7.1214$	0.9994
BKK-FS1006	05-Jan-22	$Y = 1.0563x + 1.9912$	1.0000
BKK-FS1007	05-Jan-22	$Y = 0.9689x + 1.9061$	1.0000
BKK-FS1008	05-Jan-22	$Y = 1.0132x + 1.1633$	0.9960
BKK-FS1009	05-Jan-22	$Y = 1.0033x + 0.5758$	0.9999
BKK-FS1010	05-Jan-22	$Y = 1.0033x + 0.5758$	0.9999
BKK-FS1011	05-Jan-22	$Y = 1.0021x + 0.3148$	1.0000
BKK-FS1012	05-Jan-22	$Y = 0.9994x + 1.786$	0.9998
BKK-FS1013	05-Jan-22	$Y = 1.0105x + 80.256$	0.9998
BKK-FS1014	05-Jan-22	$Y = 0.9995x + 0.649$	1.0000
BKK-FS1015	05-Jan-22	$Y = 1.0011x + 1.1786$	1.0000
BKK-FS1016	05-Jan-22	$Y = 1.0023x + 68.424$	0.9996
BKK-FS1017	05-Jan-22	$Y = 0.9887x + 2.8844$	0.9999
BKK-FS1018	05-Jan-22	$Y = 1.0033x + 68.424$	0.9999
BKK-FS1019	05-Jan-22	$Y = 0.9887x + 1.8005$	0.9997
BKK-FS1020	05-Jan-22	$Y = 1.0023x + 17.957$	0.9999
BKK-FS1021	05-Jan-22	$Y = 1.0094x + 0.0717$	0.9999
BKK-FS1022	05-Jan-22	$Y = 1.0042x + 0.4086$	0.9997
BKK-FS1023	05-Jan-22	$Y = 1.0132x + 88.507$	0.9996
BKK-FS1024	05-Jan-22	$Y = 0.9902x + 0.9564$	1.0000
BKK-FS1025	05-Jan-22	$Y = 1.0086x + 2.279$	1.0000
BKK-FS1026	05-Jan-22	$Y = 1.0105x + 81.055$	0.9997



ROTA METER CALIBRATION RESULT JANUARY 2022

Rotameter ID	Calibration Date	Regression Result	Coefficient (R ²)
BKK-FS1029	05-Jan-22	$Y = 0.9908x + 0.5234$	1.0000
BKK-FS1030	05-Jan-22	$Y = 1.0039x + 0.515$	0.9999
BKK-FS1031	05-Jan-22	$Y = 1.009x + 79.295$	0.9998
BKK-FS1032	04-Jan-22	$Y = 0.9918x + 8.1524$	0.9998
BKK-FS1033	04-Jan-22	$Y = 1.0135x + 10.177$	0.9985
BKK-FS1034	04-Jan-22	$Y = 1.0045x + 7.791$	0.9998
BKK-FS1035	04-Jan-22	$Y = 1.0014x + 1.305$	0.9994
BKK-FS1036	04-Jan-22	$Y = 1.0172x + 10.385$	0.9999
BKK-FS1037	04-Jan-22	$Y = 1.0458x + 1.0136$	0.9996
BKK-FS1038	05-Jan-22	$Y = 0.9812x + 159.71$	1.0000
BKK-FS1039	05-Jan-22	$Y = 1.0032x + 5.0714$	0.9997
BKK-FS1040	05-Jan-22	$Y = 1.0032x + 5.0714$	0.9997
BKK-FS1041	05-Jan-22	$Y = 0.9914x + 0.6427$	0.9997
BKK-FS1042	05-Jan-22	$Y = 0.9893x + 6.5919$	0.9998
BKK-FS1043	05-Jan-22	$Y = 1.0031x + 77.881$	0.9996
RYG-FS0197	04-Jan-22	$Y = 1.0088x + 18.196$	0.9998
RYG-FS0198	04-Jan-22	$Y = 1.0088x + 18.196$	0.9995
RYG-FS0199	04-Jan-22	$Y = 1.2025x + 3.5762$	0.9999

Review By:

(M. Wahan Choonharsa)
Enviro Field Services Manager

Approved By:

(M. Samyuth Jitranon)
Assistant General Manager



ROTA METER CALIBRATION RESULT APRIL 2022

Rotameter ID	Calibration Date	Regression Result	Coefficient (R ²)
BKK-FS0777	01-Apr-22	$Y = 1.0023x + 0.1976$	1.0000
BKK-FS0779	01-Apr-22	$Y = 1.0076x + 0.7169$	0.9998
BKK-FS0783	01-Apr-22	$Y = 1.018x + 0.3922$	1.0000
BKK-FS0904	01-Apr-22	$Y = 1.009x + 2.2652$	0.9997
BKK-FS0905	01-Apr-22	$Y = 1.018x + 5.6756$	0.9997
BKK-FS0906	01-Apr-22	$Y = 1.0256x + 1.524$	0.9995
BKK-FS0907	01-Apr-22	$Y = 1.015x + 3.6919$	0.9996
BKK-FS0908	01-Apr-22	$Y = 1.0194x + 4.8537$	0.9999
BKK-FS0909	01-Apr-22	$Y = 0.9918x + 4.8609$	0.9999
BKK-FS0910	01-Apr-22	$Y = 1.0038x + 32.714$	0.9985
BKK-FS0911	01-Apr-22	$Y = 0.9812x + 159.71$	0.9985
BKK-FS0912	01-Apr-22	$Y = 0.9802x + 62.87$	0.9999
BKK-FS0913	01-Apr-22	$Y = 1.0239x + 98.162$	0.9999
BKK-FS0914	01-Apr-22	$Y = 0.9812x + 26.806$	0.9991
BKK-FS0915	01-Apr-22	$Y = 0.9802x + 61.653$	0.9978
BKK-FS1005	01-Apr-22	$Y = 0.9894x + 17.69$	0.9990
BKK-FS1006	01-Apr-22	$Y = 1.0053x + 5.0768$	0.9997
BKK-FS1007	01-Apr-22	$Y = 1.2142x + 7.1037$	0.9993
BKK-FS1008	01-Apr-22	$Y = 0.9917x + 1.6952$	1.0000
BKK-FS1009	01-Apr-22	$Y = 1.0132x + 0.7207$	1.0000
BKK-FS1010	01-Apr-22	$Y = 1.0132x + 1.1633$	0.9960
BKK-FS1011	01-Apr-22	$Y = 1.0033x + 0.5758$	0.9999
BKK-FS1012	01-Apr-22	$Y = 1.0224x + 0.1759$	0.9996
BKK-FS1013	01-Apr-22	$Y = 1.0106x + 2.0048$	0.9997
BKK-FS1014	01-Apr-22	$Y = 0.9677x + 35.851$	0.9997
BKK-FS1015	01-Apr-22	$Y = 1.0021x + 0.3148$	0.9998
BKK-FS1016	01-Apr-22	$Y = 0.9984x + 1.786$	1.0000
BKK-FS1017	01-Apr-22	$Y = 1.0105x + 80.256$	0.9998
BKK-FS1018	01-Apr-22	$Y = 0.9989x + 0.649$	1.0000
BKK-FS1019	01-Apr-22	$Y = 1.0011x + 1.1786$	1.0000
BKK-FS1020	01-Apr-22	$Y = 1.0023x + 68.424$	0.9996
BKK-FS1021	01-Apr-22	$Y = 1.0047x + 0.066$	0.9998
BKK-FS1022	01-Apr-22	$Y = 1.018x + 3.3286$	0.9998
BKK-FS1023	01-Apr-22	$Y = 0.9932x + 57.035$	0.9986
BKK-FS1024	01-Apr-22	$Y = 1.0094x + 0.0717$	0.9999
BKK-FS1025	01-Apr-22	$Y = 1.0042x + 0.4086$	0.9997



ROTA METER CALIBRATION RESULT APRIL 2022

Rotameter ID	Calibration Date	Regression Result	Coefficient (R ²)
BKK-FS1025	01-Apr-22	$Y = 1.0132x + 88.507$	0.9996
BKK-FS1026	01-Apr-22	$Y = 1.0018x + 1.0776$	0.9997
BKK-FS1027	01-Apr-22	$Y = 1.0053x + 0.231$	0.9995
BKK-FS1028	01-Apr-22	$Y = 0.9792x + 60.312$	0.9982
BKK-FS1029	01-Apr-22	$Y = 0.9905x + 0.8214$	1.0000
BKK-FS1030	01-Apr-22	$Y = 1.0039x + 0.515$	0.9999
BKK-FS1031	01-Apr-22	$Y = 1.009x + 79.295$	0.9998
BKK-FS1032	01-Apr-22	$Y = 0.9866x + 7.8119$	0.9993
BKK-FS1033	01-Apr-22	$Y = 1.0096x + 7.2905$	0.9990
BKK-FS1034	01-Apr-22	$Y = 1.0076x + 2.9003$	0.9999
BKK-FS1035	01-Apr-22	$Y = 1.0054x + 1.6905$	0.9995
BKK-FS1036	01-Apr-22	$Y = 1.0106x + 11.048$	0.9997
BKK-FS1037	01-Apr-22	$Y = 0.9866x + 0.3091$	0.9997
BKK-FS1038	01-Apr-22	$Y = 1.0126x + 0.7738$	0.9999
BKK-FS1039	01-Apr-22	$Y = 0.9994x + 2.6537$	0.9995
BKK-FS1040	01-Apr-22	$Y = 0.977x + 56.03$	0.9997
BKK-FS1041	01-Apr-22	$Y = 0.9914x + 0.6427$	0.9997
BKK-FS1042	01-Apr-22	$Y = 0.9893x + 6.5919$	0.9998
BKK-FS1043	01-Apr-22	$Y = 1.0031x + 77.881$	0.9996
RYG-FS0197	01-Apr-22	$Y = 1.0055x + 119.14$	0.9996
RYG-FS0198	01-Apr-22	$Y = 0.985x + 25.768$	0.9996
RYG-FS0199	01-Apr-22	$Y = 1.1166x + 3.3842$	0.9998

Review By:

(M. Wahan Choonharsa)
Enviro Field Services Manager

Approved By:

(M. Samyuth Jitranon)
Assistant General Manager



ROTA METER CALIBRATION RESULT APRIL 2022

Rotameter ID	Calibration Date	Regression Result	Coefficient (R ²)
BKK-FS1025	01-Apr-22	$Y = 1.0132x + 88.507$	0.9996
BKK-FS1026	01-Apr-22	$Y = 1.0018x + 1.0776$	0.9997
BKK-FS1027	01-Apr-22	$Y = 1.0053x + 0.231$	0.9995
BKK-FS1028	01-Apr-22	$Y = 0.9792x + 60.312$	0.9982
BKK-FS1029	01-Apr-22	$Y = 0.9905x + 0.8214$	1.0000
BKK-FS1030	01-Apr-22	$Y = 1.0039x + 0.515$	0.9999
BKK-FS1031	01-Apr-22	$Y = 1.009x + 79.295$	0.9998
BKK-FS1032	01-Apr-22	$Y = 0.9866x + 7.8119$	0.9993
BKK-FS1033	01-Apr-22	$Y = 1.0096x + 7.2905$	0.9990
BKK-FS1034	01-Apr-22	$Y = 1.0076x + 2.9003$	0.9999
BKK-FS1035	01-Apr-22	$Y = 1.0054x + 1.6905$	0.9995
BKK-FS1036	01-Apr-22	$Y = 1.0106x + 11.048$	0.9997
BKK-FS1037	01-Apr-22	$Y = 0.9866x + 0.3091$	0.9997
BKK-FS1038	01-Apr-22	$Y = 1.0126x + 0.7738$	0.9999
BKK-FS1039	01-Apr-22	$Y = 0.9994x + 2.6537$	0.9995
BKK-FS1040	01-Apr-22	$Y = 0.977x + 56.03$	0.9997
BKK-FS1041	01-Apr-22	$Y = 0.9914x + 0.6427$	0.9997
BKK-FS1042	01-Apr-22	$Y = 0.9893x + 6.5919$	0.9998
BKK-FS1043	01-Apr-22	$Y = 1.0031x + 77.881$	0.9996
RYG-FS0197	01-Apr-22	$Y = 1.0055x + 119.14$	0.9996
RYG-FS0198	01-Apr-22	$Y = 0.985x + 25.768$	0.9996
RYG-FS0199	01-Apr-22	$Y = 1.1166x + 3.3842$	0.9998

Review By:

(M. Wahan Choonharsa)
Enviro Field Services Manager

Approved By:

(M. Samyuth Jitranon)
Assistant General Manager

Summary of Measurement Results:

Parameter	Pass	Fail	Conformance	Maximum permitted uncertainty of measurement (MPE)
1. Absolute uncertainty	✓	✓	✓	N/A
2. Self-generated noise	✓	✓	✓	N/A
3. Acoustic signal tone of frequency weighting	✓	✓	✓	N/A
4. Electrical signal tone of frequency weighting	✓	✓	✓	N/A
5. Frequency and time weighting at 1 kHz	✓	✓	✓	N/A
6. Long-term stability	✓	✓	✓	N/A
7. Level linearity on the reference level range	✓	✓	✓	N/A
8. Level linearity including the level range control	✓	✓	✓	N/A
9. Time burst response	✓	✓	✓	N/A
10. Peak C-weight level	✓	✓	✓	N/A
11. Overload indication	✓	✓	✓	N/A
12. High level stability	✓	✓	✓	N/A

QP-0012-04-04-00000

7. R. R. R.

5. Level linearity on the reference level range

Accepted Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
117.0	117.1	0.1	±0.2
118.0	118.1	0.1	±0.2
119.0	119.1	0.1	±0.2
120.0	120.1	0.1	±0.2
121.0	121.1	0.1	±0.2
122.0	122.1	0.1	±0.2
123.0	123.1	0.1	±0.2
124.0	124.1	0.1	±0.2
125.0	125.1	0.1	±0.2
126.0	126.1	0.1	±0.2
127.0	127.1	0.1	±0.2
128.0	128.1	0.1	±0.2
129.0	129.1	0.1	±0.2
130.0	130.1	0.1	±0.2
131.0	131.1	0.1	±0.2
132.0	132.1	0.1	±0.2
133.0	133.1	0.1	±0.2
134.0	134.1	0.1	±0.2
135.0	135.1	0.1	±0.2
136.0	136.1	0.1	±0.2
137.0	137.1	0.1	±0.2
138.0	138.1	0.1	±0.2
139.0	139.1	0.1	±0.2
140.0	140.1	0.1	±0.2
141.0	141.1	0.1	±0.2
142.0	142.1	0.1	±0.2
143.0	143.1	0.1	±0.2
144.0	144.1	0.1	±0.2
145.0	145.1	0.1	±0.2
146.0	146.1	0.1	±0.2
147.0	147.1	0.1	±0.2
148.0	148.1	0.1	±0.2
149.0	149.1	0.1	±0.2
150.0	150.1	0.1	±0.2
151.0	151.1	0.1	±0.2
152.0	152.1	0.1	±0.2
153.0	153.1	0.1	±0.2
154.0	154.1	0.1	±0.2
155.0	155.1	0.1	±0.2
156.0	156.1	0.1	±0.2
157.0	157.1	0.1	±0.2
158.0	158.1	0.1	±0.2
159.0	159.1	0.1	±0.2
160.0	160.1	0.1	±0.2
161.0	161.1	0.1	±0.2
162.0	162.1	0.1	±0.2
163.0	163.1	0.1	±0.2
164.0	164.1	0.1	±0.2
165.0	165.1	0.1	±0.2
166.0	166.1	0.1	±0.2
167.0	167.1	0.1	±0.2
168.0	168.1	0.1	±0.2
169.0	169.1	0.1	±0.2
170.0	170.1	0.1	±0.2
171.0	171.1	0.1	±0.2
172.0	172.1	0.1	±0.2
173.0	173.1	0.1	±0.2
174.0	174.1	0.1	±0.2
175.0	175.1	0.1	±0.2
176.0	176.1	0.1	±0.2
177.0	177.1	0.1	±0.2
178.0	178.1	0.1	±0.2
179.0	179.1	0.1	±0.2
180.0	180.1	0.1	±0.2
181.0	181.1	0.1	±0.2
182.0	182.1	0.1	±0.2
183.0	183.1	0.1	±0.2
184.0	184.1	0.1	±0.2
185.0	185.1	0.1	±0.2
186.0	186.1	0.1	±0.2
187.0	187.1	0.1	±0.2
188.0	188.1	0.1	±0.2
189.0	189.1	0.1	±0.2
190.0	190.1	0.1	±0.2
191.0	191.1	0.1	±0.2
192.0	192.1	0.1	±0.2
193.0	193.1	0.1	±0.2
194.0	194.1	0.1	±0.2
195.0	195.1	0.1	±0.2
196.0	196.1	0.1	±0.2
197.0	197.1	0.1	±0.2
198.0	198.1	0.1	±0.2
199.0	199.1	0.1	±0.2
200.0	200.1	0.1	±0.2
201.0	201.1	0.1	±0.2
202.0	202.1	0.1	±0.2
203.0	203.1	0.1	±0.2
204.0	204.1	0.1	±0.2
205.0	205.1	0.1	±0.2
206.0	206.1	0.1	±0.2
207.0	207.1	0.1	±0.2
208.0	208.1	0.1	±0.2
209.0	209.1	0.1	±0.2
210.0	210.1	0.1	±0.2
211.0	211.1	0.1	±0.2
212.0	212.1	0.1	±0.2
213.0	213.1	0.1	±0.2
214.0	214.1	0.1	±0.2
215.0	215.1	0.1	±0.2
216.0	216.1	0.1	±0.2
217.0	217.1	0.1	±0.2
218.0	218.1	0.1	±0.2
219.0	219.1	0.1	±0.2
220.0	220.1	0.1	±0.2
221.0	221.1	0.1	±0.2
222.0	222.1	0.1	±0.2
223.0	223.1	0.1	±0.2
224.0	224.1	0.1	±0.2
225.0	225.1	0.1	±0.2
226.0	226.1	0.1	±0.2
227.0	227.1	0.1	±0.2
228.0	228.1	0.1	±0.2
229.0	229.1	0.1	±0.2
230.0	230.1	0.1	±0.2
231.0	231.1	0.1	±0.2
232.0	232.1	0.1	±0.2
233.0	233.1	0.1	±0.2
234.0	234.1	0.1	±0.2
235.0	235.1	0.1	±0.2
236.0	236.1	0.1	±0.2
237.0	237.1	0.1	±0.2
238.0	238.1	0.1	±0.2
239.0	239.1	0.1	±0.2
240.0	240.1	0.1	±0.2
241.0	241.1	0.1	±0.2
242.0	242.1	0.1	±0.2
243.0	243.1	0.1	±0.2
244.0	244.1	0.1	±0.2
245.0	245.1	0.1	±0.2
246.0	246.1	0.1	±0.2
247.0	247.1	0.1	±0.2
248.0	248.1	0.1	±0.2
249.0	249.1	0.1	±0.2
250.0	250.1	0.1	±0.2
251.0	251.1	0.1	±0.2
252.0	252.1	0.1	±0.2
253.0	253.1	0.1	±0.2
254.0	254.1	0.1	±0.2
255.0	255.1	0.1	±0.2
256.0	256.1	0.1	±0.2
257.0	257.1	0.1	±0.2
258.0	258.1	0.1	±0.2
259.0	259.1	0.1	±0.2
260.0	260.1	0.1	±0.2
261.0	261.1	0.1	±0.2
262.0	262.1	0.1	±0.2
263.0	263.1	0.1	±0.2
264.0	264.1	0.1	±0.2
265.0	265.1	0.1	±0.2
266.0	266.1	0.1	±0.2
267.0	267.1	0.1	±0.2
268.0	268.1	0.1	±0.2
269.0	269.1	0.1	±0.2
270.0	270.1	0.1	±0.2
271.0	271.1	0.1	±0.2
272.0	272.1	0.1	±0.2
273.0	273.1	0.1	±0.2
274.0	274.1	0.1	±0.2
275.0	275.1	0.1	±0.2
276.0	276.1	0.1	±0.2
277.0	277.1	0.1	±0.2
278.0	278.1	0.1	±0.2
279.0	279.1	0.1	±0.2
280.0	280.1	0.1	±0.2
281.0	281.1	0.1	±0.2
282.0	282.1	0.1	±0.2
283.0	283.1	0.1	±0.2
284.0	284.1	0.1	±0.2
285.0	285.1	0.1	±0.2
286.0	286.1	0.1	±0.2
287.0	287.1	0.1	±0.2
288.0	288.1	0.1	±0.2
289.0	289.1	0.1	±0.2
290.0	290.1	0.1	±0.2
291.0	291.1	0.1	±0.2
292.0	292.1	0.1	±0.2
293.0	293.1	0.1	±0.2
294.0	294.1	0.1	±0.2
295.0	295.1	0.1	±0.2
296.0	296.1	0.1	±0.2
297.0	297.1	0.1	±0.2
298.0	298.1	0.1	±0.2
299.0	299.1	0.1	±0.2
300.0	300.1	0.1	±0.2
301.0	301.1	0.1	±0.2
302.0	302.1	0.1	±0.2
303.0	303.1	0.1	±0.2
304.0	304.1	0.1	±0.2
305.0	305.1	0.1	±0.2
306.0	306.1	0.1	±0.2
307.0	307.1	0.1	±0.2
308.0	308.1	0.1	±0.2
309.0	309.1	0.1	±0.2
310.0	310.1	0.1	±0.2
311.0	311.1	0.1	±0.2
312.0	312.1	0.1	±0.2
313.0	313.1	0.1	±0.2
314.0	314.1	0.1	±0.2
315.0	315.1	0.1	±0.2
316.0	316.1	0.1	±0.2
317.0	317.1	0.1	±0.2
318.0	318.1	0.1	±0.2
319.0	319.1	0.1	±0.2
320.0	320.1	0.1	±0.2
321.0	321.1	0.1	±0.2
322.0	322.1	0.1	±0.2
323.0	323.1	0.1	±0.2
324.0	324.1	0.1	±0.2
325.0	325.1	0.1	±0.2
326.0	326.1	0.1	±0.2
327.0	327.1	0.1	±0.2
328.0	328.1	0.1	±0.2
329.0	329.1	0.1	±0.2
330.0	330.1	0.1	±0.2
331.0	331.1	0.1	±0.2
332.0	332.1	0.1	±0.2
333.0	333.1	0.1	±0.2
334.0	334.1	0.1	±0.2
335.0	335.1	0.1	±0.2
336.0	336.1	0.1	±0.2
337.0	337.1	0.1	±0.2
338.0	338.1	0.1	±0.2
339.0	339.1	0.1	±0.2
340.0	340.1	0.1	±0.2
341.0	341.1	0.1	±0.2
342.0	342.1	0.1	±0.2
343.0	343.1	0.1	±0.2
344.0	344.1	0.1	±0.2
345.0	345.1	0.1	±0.2
346.0	346.1	0.1	±0.2
347.0	347.1	0.1	±0.2
348.0	348.1	0.1	±0.2
349.0	349.1	0.1	±0.2
350.0	350.1	0.1	±0.2
351.0	351.1	0.1	±0.2
352.0	352.1	0.1	±0.2
353.0	353.1	0.1	±0.2
354.0	354.1	0.1	±0.2
355.0	355.1	0.1	±0.2
356.0	356.1	0.1	±0.2
357.0	357.1	0.1	±0.2
358.0	358.1	0.1	±0.2
359.0	359.1	0.1	±0.2
360.0	360.1	0.1	±0.2
361.0	361.1	0.1	±0.2
362.0	362.1	0.1	±0.2
363.0	363.1	0.1	±0.2
364.0	364.1	0.1	±0.2
365.0	365.1	0.1	±0.2
366.0	366.1	0.1	±0.2
367.0	367.1	0.1	±0.2
368.0	368.1	0.1	±0.2
369.0	369.1	0.1	±0.2
370.0	370.1	0.1	±0.2
371.0	371.1	0.1	±0.2
372.0	372.1	0.1	±0.2
373.0	373.1	0.1	±0.2
374.0	374.1	0.1	±0.2
375.0	375.1	0.1	±0.2
376.0	376.1	0.1	±0.2
377.0	377.1	0.1	±0.2
378.0	378.1	0.1	±0.2
379.0	379.1	0.1	±0.2
380.0	380.1	0.1	±0.2
381.0	381.1	0.1	±0.2
382.0	382.1	0.1	±0.2
383.0	383.1	0.1	±0.2
384.0	384.1	0.1	±0.2
385.0	385.1	0.1	±0.2
386.0	386.1	0.1	±0.2
387.0	387.1	0.1	±0.2
388.0	388.1	0.1	±0.2
389.0	389.1	0.1	±0.2
390.0	390.1	0.1	±0.2
391.0	391.1	0.1	±0.2
392.0	392.1		

Calibration Certificate

Equipment 1 : SOUND LEVEL METER
Manufacturer 2 : K&S
Model 1 : SL-401
Serial No. 1 : 00077771 / 10123 / 70077
ID No. 1 : 803, 70027

Conditions As Found 1 : GOOD
Customer 1 : ALL LABORATORY GROUP (THAI) AND CO., LTD.
100 PHATHANAKAN 6, PHATHANAKAN ROAD,
KORANG PHATHANAKAN, KURT HEAD LUMBI,
BANGKOK, 10250 THAILAND

Location 1 : 1. 100 Phatthakan 6 Rd.
2. 100 Phatthakan 6 Rd.
3. 100 Phatthakan 6 Rd.
Calibration Date 1 : 28 AUGUST 2023
Calibration Date 2 : 01 SEPTEMBER 2023
Date of Issue 1 : 01 SEPTEMBER 2023

Calibrated by :
Approved by :
Signature :
Date :
Signature :
Date :

Signature :
Date :
Signature :
Date :

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

QP-17025-00-00-0000

Result of calibration 1.

Reference	Measured	Accepted
Acoustic Signal	Value	Unit
10.0 (dB)	10.0	0.5

2. Self generated noise

Measured Value
17.5

2.2 The decomposition of the sound level meter was replaced by electronic signal input device

Frequency	Measured value
Weighting	17.5
A-weight	17.5
C-weight	17.5
Flat	17.5

3. Acoustic signal tests of frequency weighting

Frequency	Measured	Accepted
1 Hz	Value	Unit
120	0.2	0.4
1000	0.0	0.0
8000	0.1	0.2

Calibration Method 1

This equipment was calibrated by hand on ISO 9001:2015 standard for sound level meter (SLM).
The SLM had been used to Acoustic and Electrical signal tests of frequency weighting with Acoustic chamber and Reference
Standard Instruments.

For more details of each item were made by photographs of each instrument display and also with SLM display.

Conditions of this result of calibration 1

Reference	Measured	Accepted
Acoustic Signal	Value	Unit
10.0 (dB)	10.0	0.5
100.0 (dB)	100.0	0.5
1000.0 (dB)	1000.0	0.5
8000.0 (dB)	8000.0	0.5
100.0 (dB)	100.0	0.5
1000.0 (dB)	1000.0	0.5
8000.0 (dB)	8000.0	0.5
100.0 (dB)	100.0	0.5
1000.0 (dB)	1000.0	0.5
8000.0 (dB)	8000.0	0.5

2. This result of calibration was based on data on date and place of calibration for this calibrated item only.
3. This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, and may not be reproduced
other than in full, except with the prior written approval of the head of Calibration Laboratory.

3.1 National Institute of Standards and Technology (NIST)

3.2 Thailand Institute of Standards and Technology (TIS)

QP-17025-00-00-0000

4. Electrical signal tests of frequency weighting

Weighting network response with calibrator at 1 kHz

Frequency	Measured	Accepted
1 Hz	Value	Unit
120	0.2	0.4
1000	0.0	0.0
8000	0.1	0.2

5. Frequency and time weighting at 1 kHz

3.1 Frequency weighting at 1 kHz

Frequency	Measured	Accepted
Weighting	Value	Unit
A-weight	0.2	0.4
C-weight	0.0	0.0
Flat	0.0	0.0

3.2 Time weighting at 1 kHz

Frequency	Measured	Accepted
Weighting	Value	Unit
A-weight	0.2	0.4
C-weight	0.0	0.0
Flat	0.0	0.0

6. Long-term stability

Frequency	Measured	Accepted
Weighting	Value	Unit
A-weight	0.2	0.4
C-weight	0.0	0.0
Flat	0.0	0.0

QP-17025-00-00-0000

Summary of Measurement Results

Parameter	Test	Result	Maximum permitted uncertainty (dB)
1. Absolute sensitivity	✓	0.2	0.5
2. Self generated noise	✓	17.5	0.5
3. Acoustic signal tests of frequency weighting	✓	0.2	0.5
4. Frequency and time weighting at 1 kHz	✓	0.2	0.5
5. Long-term stability	✓	0.2	0.5
6. Self generated noise	✓	17.5	0.5
7. Acoustic signal tests of frequency weighting	✓	0.2	0.5
8. Frequency and time weighting at 1 kHz	✓	0.2	0.5
9. Long-term stability	✓	0.2	0.5
10. Self generated noise	✓	17.5	0.5
11. Acoustic signal tests of frequency weighting	✓	0.2	0.5
12. Frequency and time weighting at 1 kHz	✓	0.2	0.5
13. Long-term stability	✓	0.2	0.5

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7. Level stability on the reference level range

Frequency	Measured	Accepted
1 Hz	Value	Unit
120	0.2	0.4
1000	0.0	0.0
8000	0.1	0.2
100.0 (dB)	100.0	0.5
1000.0 (dB)	1000.0	0.5
8000.0 (dB)	8000.0	0.5
100.0 (dB)	100.0	0.5
1000.0 (dB)	1000.0	0.5
8000.0 (dB)	8000.0	0.5
100.0 (dB)	100.0	0.5
1000.0 (dB)	1000.0	0.5
8000.0 (dB)	8000.0	0.5
100.0 (dB)	100.0	0.5
1000.0 (dB)	1000.0	0.5
8000.0 (dB)	8000.0	0.5
100.0 (dB)	100.0	0.5
1000.0 (dB)	1000.0	0.5
8000.0 (dB)	8000.0	0.5
100.0 (dB)	100.0	0.5
1000.0 (dB)	1000.0	0.5
8000.0 (dB)	8000.0	0.5

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6. Electrical signal test of frequency weighting

Weighting network response with tolerance at 1.0%

Frequency (Hz)	Observed Value (dB)	Desired Value (dB)	Acceptance Limits (dB)
40	0.0	-0.1	-0.5
125	0.0	0.0	0.0
200	0.0	0.0	0.0
400	0.0	0.0	0.0
1000	0.0	0.0	0.0
2000	0.0	0.0	0.0
4000	0.0	0.0	0.0

6. Frequency and time weighting at 1 kHz

5.1 Frequency weighting at 1 kHz

Frequency Weighting	Observed Value (dB)	Desired Value (dB)	Acceptance Limits (dB)
A-weighting	0.0	0.0	-0.5
C-weighting	0.0	0.0	-0.5

5.2 Time weighting at 1 kHz

Frequency Weighting	Observed Value (dB)	Desired Value (dB)	Acceptance Limits (dB)
Fast	0.0	0.0	-0.5
Slow	0.0	0.0	-0.5

6. Long-term stability

Frequency Weighting	Observed Value (dB)	Desired Value (dB)	Acceptance Limits (dB)
A-weighting	0.0	0.0	-0.5

7. Level accuracy on the reference level

Observed Value (dB)	Desired Value (dB)	Acceptance Limits (dB)
127.0	127.0	-0.5
130.0	130.0	-0.5
133.0	133.0	-0.5
136.0	136.0	-0.5
139.0	139.0	-0.5
142.0	142.0	-0.5
145.0	145.0	-0.5
148.0	148.0	-0.5
151.0	151.0	-0.5
154.0	154.0	-0.5
157.0	157.0	-0.5
160.0	160.0	-0.5
163.0	163.0	-0.5
166.0	166.0	-0.5
169.0	169.0	-0.5
172.0	172.0	-0.5
175.0	175.0	-0.5

8. Level accuracy including the level range control

Range	Observed Value (dB)	Desired Value (dB)	Acceptance Limits (dB)
0-10	0.0	0.0	-0.5

8. Time based response

Time Weighting	Observed Value (dB)	Desired Value (dB)	Acceptance Limits (dB)
Fast	0.0	0.0	-0.5
Slow	0.0	0.0	-0.5
RTL	0.0	0.0	-0.5

8. Peak C-weighted level

Number of cycles in test signal	Observed Value (dB)	Desired Value (dB)	Acceptance Limits (dB)
One	10.0	10.0	-0.5

Number of cycles in test signal	Observed Value (dB)	Desired Value (dB)	Acceptance Limits (dB)
One	10.0	10.0	-0.5

14. Overall indication

Frequency Weighting	Observed Value (dB)	Desired Value (dB)	Acceptance Limits (dB)
A-weighting	0.0	0.0	-0.5

15. High level stability

Frequency Weighting	Observed Value (dB)	Desired Value (dB)	Acceptance Limits (dB)
A-weighting	0.0	0.0	-0.5

The required accuracy is based on a standard uncertainty multiplied by coverage factor k = 2 or any other following calculation providing a level of confidence of approximately 95 %

End of Calibration Certificate

Calibration Certificate

Equipment	Manufacturer	Model	Serial No.	ID No.
WEINSTEIN	WEINSTEIN	WEINSTEIN	WEINSTEIN	WEINSTEIN

Condition As Found	Condition As Left
GOOD	GOOD

Location	Temperature	Pressure	Relative Humidity	Revised Date	Calibration Item	Date of Issue
1. 21.0 ± 0.1 °C	1. 101.3 ± 0.1 kPa	1. 50.0 ± 0.1 %	1. 50.0 ± 0.1 %	01 JUL 2017	01 JUL 2017	01 JUL 2017

Calibrated by	Approved by
T. P. P.	T. P. P.

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

Calibration Certificate

Equipment	Manufacturer	Model	Serial No.	ID No.
WEINSTEIN	WEINSTEIN	WEINSTEIN	WEINSTEIN	WEINSTEIN

Condition As Found	Condition As Left
GOOD	GOOD

Location	Temperature	Pressure	Relative Humidity	Revised Date	Calibration Item	Date of Issue
1. 21.0 ± 0.1 °C	1. 101.3 ± 0.1 kPa	1. 50.0 ± 0.1 %	1. 50.0 ± 0.1 %	01 JUL 2017	01 JUL 2017	01 JUL 2017

Calibrated by	Approved by
T. P. P.	T. P. P.

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

8. Level Kinetics: Involves the level range control

	Assigned Value (\$ mil.)	Measured Value (\$ mil.)	Observed Value (\$ mil.)	Assigned Z score (σ)
Range	100-150	100-150	100-150	0.00
Mean	100	100	100	0.00

6. Finite basis theorem

Time Weighting	Time Base	Time Base, TP	Suboptimal		Desired		Packaged		Assigning
			Cycle	Value	Value	Value	Value	Value	
Fast	1	0.25	1	100.0	0.075	-0.1	1.2	-0.6	1.0
		2000	0	117.9	116.0	0.0	1.0	-0.2	
Slow	1	0.25	0	130.0	134.0	-0.1	0.8	-0.6	1.0
		2000	0	121.9	117.0	-0.1	0.8	-0.5	
SIL	1	0.25	1	90.0	98.4	-0.2	1.2	-0.5	1.0
		2000	0	100.0	107.9	-0.1	1.0	-0.2	
			0	120.0	128.0	0.0	0.0	0.0	

1000

Number of cycles in test signal Confidence	Assigned Value (\$)	Measured Value, Legend (\$)	Declared Value (\$)	Assigned Liable (\$)
133.0	133.0	133.2	0.0	-
One	136.8	136.8	0.0	0.0

Number of cycles in test signal	Assigned Value (dB)	Measured Value (dB)	Observed Value (dB)	Assignment Error (dB)
4 consecutive	112.0	113.0	9.0	-
Positive half cycle	110.0	113.0	-3.0	-42.0
Negative half cycle	110.0	110.0	-0.0	-52.0

H. Overland Institute

Measured value (dB)	Decoded Value (dB)		Assignment Error (%)
	Positive one-half cycle	Negative one-half cycle	
80.7	80.8	82.2	11.3

Frequency Weighting	90.54 Damping at Road	90.54 Damping at Road	Decoupled Value	Achievement Limits
A-weight	1.003	1.003	0.0	-46.5

The reported maximum is based on a standard maximum multiplied by coverage factor $k = 2$ and any value following calculations providing a level of confidence of approximately 95%.

Certificate of Calibration

Equipment:	Source Catalyst
Manufacturer:	8026
Model/Type:	NC-76
Serial No.:	90176117
ID No.:	901765836
Custodian:	ACS Laboratory Group (Thailand) Co., Ltd.
Address:	101 Muangpak Rd., Muangpak Bk., Khwaeng Muangpak Jong Nuea Luang, Bangkok 12200 Thailand
Received Date:	18 March 2021
Calibration Date:	14 March 2021
Issued Date:	18 March 2021
Calibrated by:	Ms. Jintarn Nuchkarn

Approved by _____
 (Name of the person in charge of the project)

100

Equipment:	Shimadzu
Manufacturer:	NOVA
Model/Type:	NC 53
Serial No.:	1011117
Q No.:	604 / 53243
Ambient Temperature:	23 ± 2 °C
Relative Humidity:	50 ± 10 %
Pressure:	1013 ± 10 hPa
Method of Calibration:	-

Condition of 1914 result of calibration

A. Activities (7-point distribution = total)			
Surveying	Navigation	Navigation frequency (Hz)	Maximum value ^a
Second harmonic band (dB)	94	1.0	2.5

Usability of measurements		
Particular	Usability	Maximum percentage
Second primary peak	2.11 dB	2.11 dB
Secondary frequency	2.11 dB	2.11 dB

Variable	Mean	SD	Min	Max
Age	31.1	10.5	18	55

Calibration Certificate

Equipment 1	WINDLEVEL METER	NAME
Manufacturer 2	W300	
Model 1	W3-42 Ultrasonic V3-42 Programmable V30 19	
Serial No.	00000001000000000000	
ID No.	NAE-1000001	
Condition As Found 1	WORKED	
Comments 1	ALL LABORATORY CHECKS OF THIS ANEMOMETER, USED FOR MEASUREMENTS IN THE THAIKANG ROAD, KROKHONG DISTRICT TOWN, SAKET WATANA PROVINCE, WERE THROUGH.	
Location 1		
Ambient Temperature 1	23.04 ± 0.3	°C
Pressure 1	1003.2 ± 0.3	hPa
Relative Humidity 1	76.0 ± 2.0	%
Received Date 1	26 SEPTEMBER 2003	
Collection Date 1	13-19 OCTOBER 2003	

Approved by: T. K. Tolson

Cert. No. : ACL21082
Job No. : VCM4C0860
Pages : 8 of 8

11. Overload stability

Measured value (dB)	Deviation	Acceptance
Positive	Value	Limit
100.0	0.0	+0.5

12. High level stability

Frequency	SLM Display	Deviation	Acceptance
125 Hz	Value	Limit	
1000 Hz	Value	Limit	
8000 Hz	Value	Limit	

This report is based on a standard uncertainty multiplied by coverage factor k = 2
at a level of confidence of approximately 95 %

End of Calibration Certificate

QP-7512-04-04-020664

Cert. No. : ACL21082
Job No. : VCM4C0860
Pages : 4 of 8

Calibration Certificate

Equipment :
Manufacturer :
Model :
Serial No. :
ID No. :

Condition As Found :
Customer :
Location :
Ambient Temperature :
Pressure :
Relative Humidity :
Received Date :
Calibration Due :
Date of Issue :

Calibrated by :
Approved by :
Thailand (Precedent) :

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard, and has been signed
after due to full, except with the prior written approval of the head of Calibration Laboratory

QP-7512-04-04-020664

Cert. No. : ACL21082
Job No. : VCM4C0860
Pages : 5 of 8

Calibration Procedure : CP-AC-01

Calibration Method :

This equipment was calibrated by based on IEC-60725-1 (2013) Standard for sound level meter (SLM).
The SLM had test to Acoustical and Electrical signal tests of frequency weighting with Acoustic chamber and Reference
Standard Instruments.
For test results of each item were made by observation of each instrument display and also with SLM's display.

Condition of this result of calibration :

1. Reference Standard Instruments :

Instrument	Model	Serial No.	Cert. No.	Due Date
Waveform Generator	33210A	M748017016	EP-0012-21	10-Feb-22
Waveform Generator	33511B	M75202742	EP-0011-21	10-Feb-22
Digital Multimeter	3441A	M753220104	BEI-000094	10-Feb-22
Digital Multimeter	3446A	M753220104	BEI-000094	10-Feb-22
Digital Multimeter	3446A	M753220104	BEI-000094	10-Feb-22
Programmer	MAT-070	62100114	1365-07774E	08-Mar-22
Customer Microphone	4180	297900	A6-1088-21	05-Feb-22
Measuring Amplifier	NA-425A1	3456095	AA-3003-21	16-Feb-22

2. This result of calibration was found accurate as shown on date and place of calibration for this calibrated item only.

3. This certificate is traceable to the international system of unit maintained at :

3.1 National Institute of Metrology (Thailand).

3.2 Thailand Institute of Scientific and Technological Research (TISTR).

QP-7512-04-04-020664

Cert. No. : ACL21082
Job No. : VCM4C0860
Pages : 3 of 8

Summary of Measurement Result:

Parameter	Pass	Fail	Uncertainty	Maximum-permitted
1. Absolute sensitivity	✓	✓	0.2	N/A
2. Self-generated noise	✓	✓	0.3	0.6
3. Acoustical signal tests of frequency weightings	✓	✓	0.3	0.6
4. Electrical signal tests of frequency weightings	✓	✓	0.3	0.6
5. Frequency and time weightings at 1 kHz	✓	✓	0.2	0.2
6. Long-term stability	✓	✓	0.1	0.1
7. Level linearity on the reference level range	✓	✓	0.2	0.3
8. Level linearity including the level range control	✓	✓	0.2	0.3
9. Tone burst response	✓	✓	0.2	0.3
10. Peak C sound level	✓	✓	0.2	0.3
11. Overload indication	✓	✓	0.2	0.25
12. High level stability	✓	✓	0.1	0.1

QP-7512-04-04-020664

Cert. No. : ACL21082
Job No. : VCM4C0860
Pages : 4 of 8

Result of calibration:

1. Absolute sensitivity

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

2. Self-generated noise

2.1 Normal test

Measured Value
(dB)
16.1

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

Frequency	Measured	Deviation	Acceptance
Weighting	Value	(dB)	Limit
A-weight	11.6		
C-weight	17.8		
Flat	23.6		

3. Acoustical signal tests of frequency weightings

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

Frequency	Flat	C-weight	A-weight	Acceptance
125	0.3	0.4	0.3	±1.2
1000	0.0	0.0	0.0	±1.0
8000	0.3	0.5	0.3	±0.0

QP-7512-04-04-020664

Cert. No. : ACL21082
Job No. : VCM4C0860
Pages : 5 of 8

4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz

Frequency	Flat	C-weight	A-weight	Acceptance
63	0.0	-0.1	-0.1	±2.0
125	0.0	0.0	-0.1	±1.5
250	0.0	-0.1	-0.1	±1.5
500	0.1	0.0	-0.1	±1.5
1000	0.0	0.0	0.0	±1.0
2000	0.1	0.0	0.0	±2.0
4000	0.1	0.0	0.0	±2.0
8000	0.1	0.0	0.0	±2.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

Frequency	Measured	Deviation	Acceptance
Weighting	Value	(dB)	Limit
A-weight	93.9	0.0	-
C-weight	94.0	0.0	±0.2
Flat	93.9	0.0	±0.2

5.2 Time weighting at 1 kHz

Frequency	Measured	Deviation	Acceptance
Value	Value	Value	Limit
93.9	93.9	0.0	-
Slow	93.9	0.0	±0.1
Fast	93.9	0.0	±0.1

6. Long-term stability

Frequency	SLM Display	SLM Display	Acceptance
Weighting	at initial	at final	Value
A-weight	94.0	94.1	0.1

QP-7512-04-04-020664

7. Level linearity on the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
136.0	136.1	0.1	±1.1
135.0	135.1	0.1	±1.1
134.0	134.1	0.1	±1.1
133.0	133.0	0.0	±1.1
132.0	132.0	0.0	±1.1
131.0	131.0	0.0	±1.1
129.0	129.0	0.0	±1.1
124.0	124.0	0.0	±1.1
119.0	119.1	0.1	±1.1
114.0	114.1	0.1	±1.1
109.0	109.1	0.1	±1.1
104.0	104.1	0.1	±1.1
99.0	99.1	0.1	±1.1
94.0	94.0	0.0	±1.1
89.0	89.0	0.0	±1.1
84.0	84.0	0.0	±1.1
79.0	79.0	0.0	±1.1
74.0	74.0	0.0	±1.1
69.0	69.0	0.0	±1.1
64.0	64.0	0.0	±1.1
59.0	59.0	0.0	±1.1
54.0	54.0	0.0	±1.1
49.0	49.0	0.0	±1.1
44.0	44.0	0.0	±1.1
39.0	39.0	0.0	±1.1
34.0	34.0	0.0	±1.1
30.0	29.9	-0.1	±1.1
29.0	28.9	-0.1	±1.1
28.0	27.9	-0.1	±1.1
27.0	27.0	0.0	±1.1
26.0	26.0	0.0	±1.1
25.0	24.9	-0.1	±1.1

QP-TS10-04-02066

8. Level linearity including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Auto	94.0	94.0	0.0	±1.1

9. Tone burst response

Time Weighting	Tone burst duration, Th (ms)	Cycle	Anticipated Value (dB)	Measured Value (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Fast	0.25	1	108.0	107.9	-0.1	1.5 ~ -5.0
	2	8	117.0	116.9	-0.1	1.0 ~ -2.5
	200	800	134.0	134.0	0.0	±1.0
Slow	2	8	108.0	108.0	0.0	1.5 ~ -5.0
	200	800	127.6	127.6	0.0	±1.0
	0.25	1	99.0	98.8	-0.2	1.5 ~ -5.0
SEL	2	8	108.0	107.9	-0.1	1.0 ~ -2.5
	200	800	128.0	128.0	0.0	±1.0

10. Peak Count level

Number of cycle in test signal	Anticipated Value (dB)	Measured Value, Leveled (dB)	Deviated Value (dB)	Acceptance Limits (dB)
Continuous	133.0	133.0	0.0	-
One	136.4	136.4	0.0	±3.0

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

QP-TS10-04-02066

Calibration Certificate

Equipment : SOUND LEVEL METER

Manufacturer : H&K

Model : H&K 421

Serial No. : 0017179

ID No. : 0017179

Condition As Found :

Comments :

Location :

Ambient Temperature :

Relative Humidity :

Received Date :

Calibration Date :

Date of Issue :

Calibrated by :

Approved by :

(Thailand)

(Thailand)

(Thailand)

(Thailand)

(Thailand)

(Thailand)

(Thailand)

(Thailand)

(Thailand)

(Thailand)

(Thailand)

(Thailand)

(Thailand)

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(Thailand)

(Thailand)

(Thailand)

Continuation of Calibration Certificate

Calibration Procedures :

Calibration Method :

The equipment was calibrated by using an IEC 61673-1 (2011) Standard for sound level meter (SLM).

The SLM had been to Acoustic and Electrical signal tests of frequency weighting with G-weighting and Reference Standard Intercomparison.

For each result of each item was made by observation of each measurement display and also with SLM display.

Condition of this result of calibration :

1. Reference Standard Intercomparison

Instrument

Manufacturer

Model

Serial No.

Cert. No.

Due Date

13116A

13116A

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Continuation of Calibration Certificate

Summary of Measurement Result :

Parameter	Pass	Fail	Uncertainty (dB)	Maximum-permitted uncertainty of measurement (dB)
1. Absolute sensitivity	✓	✓	0.2	N/A
2. Self-generated noise	✓	✓	0.2	N/A
3. Acoustical signal tests of frequency weightings	✓	✓	0.3	0.6
125 Hz	✓	✓	0.3	0.6
1000 Hz	✓	✓	0.3	0.6
4. Electrical signal tests of frequency weightings	✓	✓	0.3	0.7
For 10 Hz to 4 kHz	✓	✓	0.3	0.6
For > 10 kHz to 10 kHz	✓	✓	0.3	0.7
5. Frequency and time weighting at 1 kHz	✓	✓	0.2	0.2
6. Long-term stability	✓	✓	0.1	0.1
7. Level linearity on the reference level range	✓	✓	0.2	0.3
8. Level linearity including the level range control	✓	✓	0.2	0.3
9. Tone burst response	✓	✓	0.2	0.35
10. Peak C sound level	✓	✓	0.2	0.25
11. Overload indication	✓	✓	0.1	0.1
12. High level stability	✓	✓	0.1	0.1

QP-TS10-04-02066

QP-TS10-04-02066

QP-TS10-04-02066

Continuation of Calibration Certificate

Cert. No. : ACL21083
Job No. : VCS44C060
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Result of calibration 1.

1. Absolute sensitivity

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

2. Self-generated noise

2.1 Normal test

Measured Value (dB)
15.1

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

Frequency Weighting	Measured value (dB)
A-weight	12.0
C-weight	18.1
Flat	23.9

3. Acoustical signal tests of frequency weightings

3.1 Meter free-field acoustic response at a level of 94 dB

Frequency (Hz)	Flat	C-weight	A-weight	Deviation from various frequency weighting response curve (dB)	Acceptance Limits
125	0.2	0.3	0.3	0.3	±1.5
1000	0.0	0.0	0.0	0.0	±1.0
2000	0.7	0.8	0.8	0.8	±2.0

QP-7522-04-04-020604

Continuation of Calibration Certificate

Cert. No. : ACL21083
Job No. : VCS44C060
Page : 7 of 8

8. Level accuracy including the best range control

Range	Accepted Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Audio	94.0	94.0	0.0	±1.1

9. Time base response

Time Weighting	Frequency (Hz)	Accepted Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Fast	125	119.0	119.0	0.0	±1.2
Fast	1000	117.0	117.0	0.0	±1.2
Slow	125	119.0	119.0	0.0	±1.2
Slow	1000	117.0	117.0	0.0	±1.2
Flat	125	119.0	119.0	0.0	±1.2
Flat	1000	117.0	117.0	0.0	±1.2

10. Peak C sound level

Number of cycle in test signal	Accepted Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
One	136.4	136.2	-0.2	±3.0

QP-7522-04-04-020604

Continuation of Calibration Certificate

Cert. No. : ACL21083
Job No. : VCS44C060
Page : 5 of 8

4. Electrical signal tests of frequency weightings

4.1 Weighting network response relative to 1 kHz

Frequency (Hz)	Flat	C-weight	A-weight	Deviation from various frequency weighting response curve (dB)	Acceptance Limits
63	-0.1	-0.1	-0.1	-0.1	±2.0
125	0.0	0.0	0.0	0.0	±1.5
250	0.0	0.0	0.0	0.0	±1.5
500	0.0	0.1	0.0	0.0	±1.5
1000	0.0	0.0	0.0	0.0	±1.0
2000	0.0	0.1	0.0	0.0	±2.0
4000	0.0	0.0	0.0	0.0	±3.0
8000	0.0	0.1	0.1	0.1	±5.0

5. Frequency and time weightings at 1 kHz

5.1 Frequency weightings at 1 kHz

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

5.2 Time weighting at 1 kHz

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

6. Long-term stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviation Value (dB)	Acceptance Limits (dB)
A-weight	94.0	94.0	0.0	±0.3

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Continuation of Calibration Certificate

Cert. No. : ACL21083
Job No. : VCS44C060
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11. Overload indication

Measurement Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
Positive one-half cycle	89.6	0.0
Negative one-half cycle	89.6	0.0

12. High level stability

Frequency Weighting	SLM Display at initial (dB)	SLM Display at final (dB)	Deviation Value (dB)	Acceptance Limits (dB)
A-weight	137.0	137.1	-0.1	±0.3

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

End of Calibration Certificate

QP-7522-04-04-020604

Continuation of Calibration Certificate

Cert. No. : ACL21083
Job No. : VCS44C060
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5. Level accuracy on the reference level range

Accepted Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits (dB)
127.0	127.0	0.0	±1.1
136.0	136.0	0.0	±1.1
137.0	137.0	0.0	±1.1
138.0	138.0	0.0	±1.1
139.0	139.0	0.0	±1.1
140.0	140.0	0.0	±1.1
141.0	141.0	0.0	±1.1
142.0	142.0	0.0	±1.1
143.0	143.0	0.0	±1.1
144.0	144.0	0.0	±1.1
145.0	145.0	0.0	±1.1
146.0	146.0	0.0	±1.1
147.0	147.0	0.0	±1.1
148.0	148.0	0.0	±1.1
149.0	149.0	0.0	±1.1
150.0	150.0	0.0	±1.1
151.0	151.0	0.0	±1.1
152.0	152.0	0.0	±1.1
153.0	153.0	0.0	±1.1
154.0	154.0	0.0	±1.1
155.0	155.0	0.0	±1.1
156.0	156.0	0.0	±1.1
157.0	157.0	0.0	±1.1
158.0	158.0	0.0	±1.1
159.0	159.0	0.0	±1.1
160.0	160.0	0.0	±1.1

QP-7522-04-04-020604

Continuation of Calibration Certificate

Cert. No. : ACL21083
Job No. : VCS44C060
Page : 3 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER
Manufacturer : K&S
Model : 91-42 Microphone (C-1) / Preamplifier (P-1)
Serial No. : 1007110001 / 1007110002
ID No. : BSA, F1000

Condition as Found : GOOD

Customer : 453 LABORATORY GROUP THAI ANVIL CO., LTD.
104 PHATTHANAKAN 46, PHATTHANAKAN ROAD,
KUTWANG PHATTHANAKAN, KUTWANG THAM 11, BANGKOK, 10250 THAILAND

Location : 4 23.8 ± 0.3 °C
Ambient Temperature : 4 68.2 ± 0.5 °F
Pressure : 4 1013 ± 0.3 hPa
Relative Humidity : 4 50.0 ± 2.0 %

Received Date : 09 AUGUST 2021
Calibration Due : 08 SEP AUGUST 2021
Date of Issue : 11 AUGUST 2021

Calibrated by : T. Petch
Approved by : T. Petch
(Thailand Petch)

This certificate is issued in accordance with the requirements of ISO/IEC 17025 standard. Any use not reproduced after date in full, except with the prior written approval of the head of Calibration Laboratory.

QP-7522-04-04-020604

Core Size = 32.711 mm
 Disk Size = 31.544 mm
 Pages = 4 of 8

9. Travel directly on the reference level range.

Sub-Item	Measured		Desired		Residuals
	Value (μ)	Value (σ)	Value (μ)	Value (σ)	
1	14.03	1.00	14.03	1.00	0.00
2	37.70	17.70	36.0	8.7	1.70
3	146.9	146.9	146.9	8.0	0.0
4	152.9	151.9	151.9	8.0	1.0
5	150.9	149.9	150.9	8.2	0.0
6	124.9	124.9	124.9	8.0	0.0
7	153.0	153.0	153.0	8.0	0.0
8	123.9	123.9	123.9	8.0	0.0
9	123.9	123.9	123.9	8.0	0.0
10	171.9	171.9	171.9	8.0	0.0
11	170.9	170.9	170.9	8.0	0.0
12	124.9	124.9	124.9	8.0	0.0
13	140.9	140.9	140.9	8.0	0.0
14	140.9	140.9	140.9	8.0	0.0
15	140.9	140.9	140.9	8.0	0.0
16	140.9	140.9	140.9	8.0	0.0
17	140.9	140.9	140.9	8.0	0.0
18	140.9	140.9	140.9	8.0	0.0
19	140.9	140.9	140.9	8.0	0.0
20	140.9	140.9	140.9	8.0	0.0
21	140.9	140.9	140.9	8.0	0.0
22	140.9	140.9	140.9	8.0	0.0
23	140.9	140.9	140.9	8.0	0.0
24	140.9	140.9	140.9	8.0	0.0
25	140.9	140.9	140.9	8.0	0.0
26	140.9	140.9	140.9	8.0	0.0
27	140.9	140.9	140.9	8.0	0.0
28	140.9	140.9	140.9	8.0	0.0
29	140.9	140.9	140.9	8.0	0.0
30	140.9	140.9	140.9	8.0	0.0
31	140.9	140.9	140.9	8.0	0.0
32	140.9	140.9	140.9	8.0	0.0
33	140.9	140.9	140.9	8.0	0.0
34	140.9	140.9	140.9	8.0	0.0
35	140.9	140.9	140.9	8.0	0.0
36	140.9	140.9	140.9	8.0	0.0
37	140.9	140.9	140.9	8.0	0.0
38	140.9	140.9	140.9	8.0	0.0
39	140.9	140.9	140.9	8.0	0.0
40	140.9	140.9	140.9	8.0	0.0
41	140.9	140.9	140.9	8.0	0.0
42	140.9	140.9	140.9	8.0	0.0
43	140.9	140.9	140.9	8.0	0.0
44	140.9	140.9	140.9	8.0	0.0
45	140.9	140.9	140.9	8.0	0.0
46	140.9	140.9	140.9	8.0	0.0
47	140.9	140.9	140.9	8.0	0.0
48	140.9	140.9	140.9	8.0	0.0
49	140.9	140.9	140.9	8.0	0.0
50	140.9	140.9	140.9	8.0	0.0
51	140.9	140.9	140.9	8.0	0.0
52	140.9	140.9	140.9	8.0	0.0
53	140.9	140.9	140.9	8.0	0.0
54	140.9	140.9	140.9	8.0	0.0
55	140.9	140.9	140.9	8.0	0.0
56	140.9	140.9	140.9	8.0	0.0
57	140.9	140.9	140.9	8.0	0.0
58	140.9	140.9	140.9	8.0	0.0
59	140.9	140.9	140.9	8.0	0.0
60	140.9	140.9	140.9	8.0	0.0
61	140.9	140.9	140.9	8.0	0.0
62	140.9	140.9	140.9	8.0	0.0
63	140.9	140.9	140.9	8.0	0.0
64	140.9	140.9	140.9	8.0	0.0
65	140.9	140.9	140.9	8.0	0.0
66	140.9	140.9	140.9	8.0	0.0
67	140.9	140.9	140.9	8.0	0.0
68	140.9	140.9	140.9	8.0	0.0
69	140.9	140.9	140.9	8.0	0.0
70	140.9	140.9	140.9	8.0	0.0
71	140.9	140.9	140.9	8.0	0.0
72	140.9	140.9	140.9	8.0	0.0
73	140.9	140.9	140.9	8.0	0.0
74	140.9	140.9	140.9	8.0	0.0
75	140.9	140.9	140.9	8.0	0.0
76	140.9	140.9	140.9	8.0	0.0
77	140.9	140.9	140.9	8.0	0.0
78	140.9	140.9	140.9	8.0	0.0
79	140.9	140.9	140.9	8.0	0.0
80	140.9	140.9	140.9	8.0	0.0
81	140.9	140.9	140.9	8.0	0.0
82	140.9	140.9	140.9	8.0	0.0
83	140.9	140.9	140.9	8.0	0.0
84	140.9	140.9	140.9	8.0	0.0
85	140.9	140.9	140.9	8.0	0.0
86	140.9	140.9	140.9	8.0	0.0
87	140.9	140.9	140.9	8.0	0.0
88	140.9	140.9	140.9	8.0	0.0
89	140.9	140.9	140.9	8.0	0.0
90	140.9	140.9	140.9	8.0	0.0
91	140.9	140.9	140.9	8.0	0.0
92	140.9	140.9	140.9	8.0	0.0
93	140.9	140.9	140.9	8.0	0.0
94	140.9	140.9	140.9	8.0	0.0
95	140.9	140.9	140.9	8.0	0.0
96	140.9	140.9	140.9	8.0	0.0
97	140.9	140.9	140.9	8.0	0.0
98	140.9	140.9	140.9	8.0	0.0
99	140.9	140.9	140.9	8.0	0.0
100	140.9	140.9	140.9	8.0	0.0

0000-0001-9300-1000

T. Ad. 61

Conv. No. : A/C/2/1999
Auth. No. : A/C/24.4.2 (conv.)
Pages : 9 of 8

8. Travel history including the last foreign country

Range	Actual/expected Value (1.00)	Measured Value (1.00)	Deviation Value (1.00)	Acceptance Limits (0.5)
Actual	0.83	0.83	0.0	0.5

A. Data Source and Sample

Time	Time Based Weighing	Time Based Gravimetry, 75 (s)	Cycle	Ascent Value (dwt)	Maximal Value (dwt)	Descent Value (dwt)	Ascent/Descent
Fast	2	1.25	1	100.0	100.0	0.0	1.0 : 0.0
	200	200	800	117.9	177.9	0.0	3.96 : 0.0
Slow	2	6	1	100.0	100.0	0.0	1.0 : 0.0
	200	200	800	109.0	170.0	0.0	4.2 : 0.0
RTL	2	32.29	1	99.4	99.4	-0.1	0.7 : -0.1
	200	200	8	100.0	100.0	0.0	1.0 : 0.0
			200	120.0	120.1	0.1	0.1 : 0

100 Books of Common Prayer

Number of cycles in non-inject combination	Anticapsid Volume (μL)	Measured Volume, Lipid Volume (μL)	Desired Volume (μL)	Anticapsid Concentration ($\mu\text{g}/\mu\text{L}$)
One	150.0	1.13 (5)	0.02	-
One	150.0	1.16 (4)	0.01	0.10

Number of cycles in next signal	Subsequent Value (ΔB_1)	Maximum Value (ΔB_1)	Deviation Value (ΔB_1)	Asymptotic Value (ΔB_1)
Condition	131.0	131.1	0.1	-
Positive half cycle	131.6	135.2	-0.2	-0.8
Negative half cycle	131.6	135.2	-0.2	-0.8

0000-0001-9304-0000

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Serv. No.: A/C171090
 Job No.: 300344-01-0002
 Page: 8 of 8

1.1. Chestnut Indivine

Moment value (dB)	Decomposition		Reference
	Positive one half cycle	Negative one half cycle	Value (dB)
10.6		10.7	11
			±1.5

1.1. High level study

Frequency weighting	SSM Display as listed (dB)	SSM Display at final (dB)	Desired System (dB)	Adjustment (dB)
A-weighting	(17)	(17.6)	(0)	+0.6

The reported accuracy is based on a statistical uncertainty multiplied by average block $\delta = 2$ and on any value following the calculation providing a level of confidence of approximately 95%.

End of Transformation if Convergence

0000-0001-9000-0000

W. B. B. B.

421-4219 Sunbury Rd., Sunbury, Kingston Parish, St. Vincent and the Grenadines
 421-4219 0000 Fax: 421-4219 e-mail: central@stvincent.gov.tt <http://www.stvincent.gov.tt>

Calibration Certificate

Equipment (1)	MS-300 L3V15, METTLER
Manufacturer(s)	MS-300
Model(s)	MS-400 Monophase (40-150), Polyphase (40-150)
Serial No(s)	00200111-170115-07022
IS No(s)	IS-000000

Condition As Found: GOOD

Customer: ALL-STATE TRUCK GROUP (STATE AUTO CO.) LTD.
100 PHILADELPHIA AVE. PHILADELPHIA, PA 19106
KIP ALTON (781) 334-6444, RUTH ALBERTSON
BARNACK, (603) 716-0140

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Conf. No. : A/CN.12/2007
 Date No. : A/CN.12/2004/4
 Pages : 3 of 8

Department of Measurement Methods (1)

[illegible]

Result of calibration:

- 1. Absolute instability**

Frequency (Hz)	Measured Value (dB)	Decomposed Value (dB)	Acceptance Limit (dB)
100	100.0	100.0	±0.5
- 2. Self-generated noise**

Frequency (Hz)	Measured Value (dB)	Decomposed Value (dB)	Acceptance Limit (dB)
100	100.0	100.0	±0.5
- 3. Absolute level**

Frequency (Hz)	Measured Value (dB)	Decomposed Value (dB)	Acceptance Limit (dB)
100	100.0	100.0	±0.5

QP 1512 (04-04-2018)

T. Pichan

Result of calibration:

- 4. Absolute level**

Frequency (Hz)	Measured Value (dB)	Decomposed Value (dB)	Acceptance Limit (dB)
100	100.0	100.0	±0.5
- 5. Self-generated noise**

Frequency (Hz)	Measured Value (dB)	Decomposed Value (dB)	Acceptance Limit (dB)
100	100.0	100.0	±0.5
- 6. Absolute level**

Frequency (Hz)	Measured Value (dB)	Decomposed Value (dB)	Acceptance Limit (dB)
100	100.0	100.0	±0.5

QP 1512 (04-04-2018)

T. Pichan

Result of calibration:

- 7. Absolute level**

Frequency (Hz)	Measured Value (dB)	Decomposed Value (dB)	Acceptance Limit (dB)
100	100.0	100.0	±0.5
- 8. Self-generated noise**

Frequency (Hz)	Measured Value (dB)	Decomposed Value (dB)	Acceptance Limit (dB)
100	100.0	100.0	±0.5
- 9. Absolute level**

Frequency (Hz)	Measured Value (dB)	Decomposed Value (dB)	Acceptance Limit (dB)
100	100.0	100.0	±0.5

QP 1512 (04-04-2018)

T. Pichan

Result of calibration:

- 10. Absolute level**

Frequency (Hz)	Measured Value (dB)	Decomposed Value (dB)	Acceptance Limit (dB)
100	100.0	100.0	±0.5
- 11. Self-generated noise**

Frequency (Hz)	Measured Value (dB)	Decomposed Value (dB)	Acceptance Limit (dB)
100	100.0	100.0	±0.5
- 12. Absolute level**

Frequency (Hz)	Measured Value (dB)	Decomposed Value (dB)	Acceptance Limit (dB)
100	100.0	100.0	±0.5

QP 1512 (04-04-2018)

T. Pichan

Result of calibration:

- 13. Absolute level**

Frequency (Hz)	Measured Value (dB)	Decomposed Value (dB)	Acceptance Limit (dB)
100	100.0	100.0	±0.5
- 14. Self-generated noise**

Frequency (Hz)	Measured Value (dB)	Decomposed Value (dB)	Acceptance Limit (dB)
100	100.0	100.0	±0.5
- 15. Absolute level**

Frequency (Hz)	Measured Value (dB)	Decomposed Value (dB)	Acceptance Limit (dB)
100	100.0	100.0	±0.5

QP 1512 (04-04-2018)

T. Pichan

Result of calibration:

- 16. Absolute level**

Frequency (Hz)	Measured Value (dB)	Decomposed Value (dB)	Acceptance Limit (dB)
100	100.0	100.0	±0.5
- 17. Self-generated noise**

Frequency (Hz)	Measured Value (dB)	Decomposed Value (dB)	Acceptance Limit (dB)
100	100.0	100.0	±0.5
- 18. Absolute level**

Frequency (Hz)	Measured Value (dB)	Decomposed Value (dB)	Acceptance Limit (dB)
100	100.0	100.0	±0.5

QP 1512 (04-04-2018)

T. Pichan

4.1. Overview of test options

Measured value (dB)	Desired Value (dB)		Significance Level (dB)
	Positive one-half cycle	Negative one-half cycle	
88.7	88.6	88.7	1.3

U.S. Study Used to Estimate

Frequency Weighting	MLM Threshold at Initial (dB)	MLM Threshold at Final (dB)	Exceed Volume (dB)	Acceptance Limits (dB)
A-weighting	127.5	127.6	9.6	98.5

The reported sensitivity is based on a model assuming a single input of 1000 units, which is not representative of the actual number of units in the system.

End of Cullage and Culling Periods

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a. Total Assets Excluding the Most Toxic Assets

Range	Independed Value (100%)	Measured Value (100%)	Observed Value (100%)	Acceptance Level (100%)
Actual	34.0	94.4	94.4	94.4

[illegible]

Time Weighting	Time Step, Δt (min)	Cycle	Normalized Volume (dm^3)	Normalized Volume (dm^3)	Normalized Volume (dm^3)	Normalized Volume (dm^3)
Total	2	1	100.0	107.9	-0.1	1.00 \pm 0.0
	2	1	117.2	117.0	-0.2	1.01 \pm 0.1
Below	2	1000	115.0	114.1	-0.1	1.01 \pm 0.1
	2	1000	100.0	100.0	-0.0	1.00 \pm 0.0
Below	2	1000	127.8	117.6	-10.2	0.92 \pm 0.0
	2	1000	117.1	117.6	0.5	1.00 \pm 0.1
0.01	2	1	100.0	100.0	-0.0	1.00 \pm 0.1
	2	1000	120.0	116.1	-3.9	0.97 \pm 0.2

10

Number of cells in one digit of C-dense	Assigned Value (± 0.5)	Measured Value (± 0.1)	Theoretical Value (± 0.1)	Assigned Value (± 0.1)
1	(1.1) \pm 0.5	(1.1) \pm 0.1	0.1	0.1
2	(1.2) \pm 0.5	(1.2) \pm 0.1	0.2	0.2
3	(1.3) \pm 0.5	(1.3) \pm 0.1	0.3	0.3
4	(1.4) \pm 0.5	(1.4) \pm 0.1	0.4	0.4
5	(1.5) \pm 0.5	(1.5) \pm 0.1	0.5	0.5
6	(1.6) \pm 0.5	(1.6) \pm 0.1	0.6	0.6
7	(1.7) \pm 0.5	(1.7) \pm 0.1	0.7	0.7
8	(1.8) \pm 0.5	(1.8) \pm 0.1	0.8	0.8
9	(1.9) \pm 0.5	(1.9) \pm 0.1	0.9	0.9
10	(2.0) \pm 0.5	(2.0) \pm 0.1	1.0	1.0

Number of cells in test group	Assigned Value	Observed Value	Assigned Value
not exposed	1.00	1.00	1.00
exposed	1.00	0.8	0.8
Positive half cycle	1.0	0.2	0.2
Negative half cycle	0.0	0.2	0.2

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Age group	Mean	SD	Median	Percentile	Skewness
18-24	17.78	1.73	17.50	4.73	0.11
25-34	17.78	1.73	17.50	4.73	0.11
35-44	17.78	1.73	17.50	4.73	0.11
45-54	17.78	1.73	17.50	4.73	0.11
55-64	17.78	1.73	17.50	4.73	0.11
65-74	17.78	1.73	17.50	4.73	0.11
75-84	17.78	1.73	17.50	4.73	0.11
85-94	17.78	1.73	17.50	4.73	0.11
95-104	17.78	1.73	17.50	4.73	0.11
105-114	17.78	1.73	17.50	4.73	0.11
115-124	17.78	1.73	17.50	4.73	0.11
125-134	17.78	1.73	17.50	4.73	0.11
135-144	17.78	1.73	17.50	4.73	0.11
145-154	17.78	1.73	17.50	4.73	0.11
155-164	17.78	1.73	17.50	4.73	0.11
165-174	17.78	1.73	17.50	4.73	0.11
175-184	17.78	1.73	17.50	4.73	0.11
185-194	17.78	1.73	17.50	4.73	0.11
195-204	17.78	1.73	17.50	4.73	0.11
205-214	17.78	1.73	17.50	4.73	0.11
215-224	17.78	1.73	17.50	4.73	0.11
225-234	17.78	1.73	17.50	4.73	0.11
235-244	17.78	1.73	17.50	4.73	0.11
245-254	17.78	1.73	17.50	4.73	0.11
255-264	17.78	1.73	17.50	4.73	0.11
265-274	17.78	1.73	17.50	4.73	0.11
275-284	17.78	1.73	17.50	4.73	0.11
285-294	17.78	1.73	17.50	4.73	0.11
295-304	17.78	1.73	17.50	4.73	0.11
305-314	17.78	1.73	17.50	4.73	0.11
315-324	17.78	1.73	17.50	4.73	0.11
325-334	17.78	1.73	17.50	4.73	0.11
335-344	17.78	1.73	17.50	4.73	0.11
345-354	17.78	1.73	17.50	4.73	0.11
355-364	17.78	1.73	17.50	4.73	0.11
365-374	17.78	1.73	17.50	4.73	0.11
375-384	17.78	1.73	17.50	4.73	0.11
385-394	17.78	1.73	17.50	4.73	0.11
395-404	17.78	1.73	17.50	4.73	0.11
405-414	17.78	1.73	17.50	4.73	0.11
415-424	17.78	1.73	17.50	4.73	0.11
425-434	17.78	1.73	17.50	4.73	0.11
435-444	17.78	1.73	17.50	4.73	0.11
445-454	17.78	1.73	17.50	4.73	0.11
455-464	17.78	1.73	17.50	4.73	0.11
465-474	17.78	1.73	17.50	4.73	0.11
475-484	17.78	1.73	17.50	4.73	0.11
485-494	17.78	1.73	17.50	4.73	0.11
495-504	17.78	1.73	17.50	4.73	0.11
505-514	17.78	1.73	17.50	4.73	0.11
515-524	17.78	1.73	17.50	4.73	0.11
525-534	17.78	1.73	17.50	4.73	0.11
535-544	17.78	1.73	17.50	4.73	0.11
545-554	17.78	1.73	17.50	4.73	0.11
555-564	17.78	1.73	17.50	4.73	0.11
565-574	17.78	1.73	17.50	4.73	0.11
575-584	17.78	1.73	17.50	4.73	0.11
585-594	17.78	1.73	17.50	4.73	0.11
595-604	17.78	1.73	17.50	4.73	0.11
605-614	17.78	1.73	17.50	4.73	0.11
615-624	17.78	1.73	17.50	4.73	0.11
625-634	17.78	1.73	17.50	4.73	0.11
635-644	17.7				

with 100% accuracy.

Calibration Certificate

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14. *Thymus praecox*

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Continuation of Calibration Certificate

8. Absolute stability

Parameter	Measured Value (L0.1)	Desired Value (L0.1)	Acceptance Limits (L0.1)
Resistance	95.0 (0.1 Ohm)	96.0	±0.3

9. Self-generated noise

Measured Value (L0.1)
14.0

2.2 The impedance of the used load is not to be replaced by standard impedances.

Frequency (Hz)	Measured Value (L0.1)	Desired Value (L0.1)	Acceptance Limits (L0.1)
1000	0.1	0.2	±0.1
10000	0.1	0.2	±0.1
100000	0.1	0.2	±0.1

10. Averaged signal rate of frequency weighting

Frequency (Hz)	Measured Value (L0.1)	Desired Value (L0.1)	Acceptance Limits (L0.1)
1000	0.1	0.2	±0.1
10000	0.1	0.2	±0.1
100000	0.1	0.2	±0.1

GP-1002 (2019-01-01)

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Continuation of Calibration Certificate

8. Load stability including the load range control

Range	Measured Value (L0.1)	Desired Value (L0.1)	Acceptance Limits (L0.1)
1000	0.1	0.2	±0.1
10000	0.1	0.2	±0.1
100000	0.1	0.2	±0.1

9. Time based response

Time	Measured Value (L0.1)	Desired Value (L0.1)	Acceptance Limits (L0.1)
1000	0.1	0.2	±0.1
10000	0.1	0.2	±0.1
100000	0.1	0.2	±0.1

10. Peak Control

Number of Cycles	Measured Value (L0.1)	Desired Value (L0.1)	Acceptance Limits (L0.1)
1000	0.1	0.2	±0.1
10000	0.1	0.2	±0.1
100000	0.1	0.2	±0.1

GP-1002 (2019-01-01)

T. Pich

Continuation of Calibration Certificate

8. Electrical signal rate of frequency weighting

Frequency (Hz)	Measured Value (L0.1)	Desired Value (L0.1)	Acceptance Limits (L0.1)
1000	0.1	0.2	±0.1
10000	0.1	0.2	±0.1
100000	0.1	0.2	±0.1

9. Frequency and time weighting at 1 kHz

Frequency (Hz)	Measured Value (L0.1)	Desired Value (L0.1)	Acceptance Limits (L0.1)
1000	0.1	0.2	±0.1
10000	0.1	0.2	±0.1
100000	0.1	0.2	±0.1

10. Time weighting at 1 kHz

Frequency (Hz)	Measured Value (L0.1)	Desired Value (L0.1)	Acceptance Limits (L0.1)
1000	0.1	0.2	±0.1
10000	0.1	0.2	±0.1
100000	0.1	0.2	±0.1

11. Long-term stability

Frequency (Hz)	Measured Value (L0.1)	Desired Value (L0.1)	Acceptance Limits (L0.1)
1000	0.1	0.2	±0.1
10000	0.1	0.2	±0.1
100000	0.1	0.2	±0.1

GP-1002 (2019-01-01)

T. Pich

Continuation of Calibration Certificate

8. Load stability

Range	Measured Value (L0.1)	Desired Value (L0.1)	Acceptance Limits (L0.1)
1000	0.1	0.2	±0.1
10000	0.1	0.2	±0.1
100000	0.1	0.2	±0.1

9. High level stability

Frequency (Hz)	Measured Value (L0.1)	Desired Value (L0.1)	Acceptance Limits (L0.1)
1000	0.1	0.2	±0.1
10000	0.1	0.2	±0.1
100000	0.1	0.2	±0.1

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

End of Calibration Certificate

GP-1002 (2019-01-01)

T. Pich

Continuation of Calibration Certificate

8. Load stability on the reference load range

Frequency (Hz)	Measured Value (L0.1)	Desired Value (L0.1)	Acceptance Limits (L0.1)
1000	0.1	0.2	±0.1
10000	0.1	0.2	±0.1
100000	0.1	0.2	±0.1

GP-1002 (2019-01-01)

T. Pich

Continuation of Calibration Certificate

8. Load stability

Range	Measured Value (L0.1)	Desired Value (L0.1)	Acceptance Limits (L0.1)
1000	0.1	0.2	±0.1
10000	0.1	0.2	±0.1
100000	0.1	0.2	±0.1

9. High level stability

Frequency (Hz)	Measured Value (L0.1)	Desired Value (L0.1)	Acceptance Limits (L0.1)
1000	0.1	0.2	±0.1
10000	0.1	0.2	±0.1
100000	0.1	0.2	±0.1

10. Peak Control

Number of Cycles	Measured Value (L0.1)	Desired Value (L0.1)	Acceptance Limits (L0.1)
1000	0.1	0.2	±0.1
10000	0.1	0.2	±0.1
100000	0.1	0.2	±0.1

11. Time based response

Time	Measured Value (L0.1)	Desired Value (L0.1)	Acceptance Limits (L0.1)
1000	0.1	0.2	±0.1
10000	0.1	0.2	±0.1
100000	0.1	0.2	±0.1

12. Absolute stability

Parameter	Measured Value (L0.1)	Desired Value (L0.1)	Acceptance Limits (L0.1)
Resistance	95.0 (0.1 Ohm)	96.0	±0.3

13. Self-generated noise

Measured Value (L0.1)
14.0

GP-1002 (2019-01-01)

T. Pich

Calibration Procedures : CP-NC-03

Calibration Method :

This equipment was calibrated by based on IEC 61010-2:2010 standard.
The stated pressure level, frequency and load capacity of the tested equipment are confirmed using the following methods:

Condition of this result of calibration :

Instrument	Model	Serial No.	Cert. No.	Due Date
Wireless Oscilloscope	33111B	MY1320742	37-001-21	10-06-22
Liquid Multimeter	33461A	MY1320914	331-001-04-0204	10-06-22
Digital Multimeter	33461A	MY1320914	331-001-04-0204	10-06-22
Programmable Resistance	33461A	MY1320914	331-001-04-0204	10-06-22
Measuring Amplifier	33461A	MY1320914	331-001-04-0204	10-06-22
Audio Analyzer	33461A	MY1320914	331-001-04-0204	10-06-22

2. This result of calibration was based on the use of the following equipment for this calibration (see table).

3. This certificate is provided by the International System of Units (SI) maintained at:

3.1 National Institute of Standards and Technology (NIST).

3.2 Thailand Institute of Standards and Technology (TIS).

GP-13013-04-04-0204

T. R. R.

Calibration Procedures : CP-NC-03

Calibration Method :

This equipment was calibrated by based on IEC 61010-2:2010 standard for used load level (1.1A).
The stated load level is confirmed and Electrical signal level of frequency weighting with calibration standard and reference standard instruments.

For each result of each item were taken by observation of each instrument display and data with 10 Hz display.

Condition of this result of calibration :

Instrument	Model	Serial No.	Cert. No.	Due Date
Wireless Oscilloscope	33111B	MY1320742	37-001-21	10-06-22
Liquid Multimeter	33461A	MY1320914	331-001-04-0204	10-06-22
Digital Multimeter	33461A	MY1320914	331-001-04-0204	10-06-22
Programmable Resistance	33461A	MY1320914	331-001-04-0204	10-06-22
Measuring Amplifier	33461A	MY1320914	331-001-04-0204	10-06-22

2. This result of calibration was based on the use of the following equipment for this calibration (see table).

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GP-13013-04-04-0204

T. R. R.

Calibration Procedures : CP-NC-03

Calibration Method :

This equipment was calibrated by based on IEC 61010-2:2010 standard.
The stated pressure level, frequency and load capacity of the tested equipment are confirmed using the following methods:

Condition of this result of calibration :

Instrument	Model	Serial No.	Cert. No.	Due Date
Wireless Oscilloscope	33111B	MY1320742	37-001-21	10-06-22
Liquid Multimeter	33461A	MY1320914	331-001-04-0204	10-06-22
Digital Multimeter	33461A	MY1320914	331-001-04-0204	10-06-22
Programmable Resistance	33461A	MY1320914	331-001-04-0204	10-06-22
Measuring Amplifier	33461A	MY1320914	331-001-04-0204	10-06-22
Audio Analyzer	33461A	MY1320914	331-001-04-0204	10-06-22

2. This result of calibration was based on the use of the following equipment for this calibration (see table).

3. This certificate is provided by the International System of Units (SI) maintained at:

3.1 National Institute of Standards and Technology (NIST).

3.2 Thailand Institute of Standards and Technology (TIS).

3. The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k = 2.

at any value following calibration providing a level of confidence of approximately 95 %.

End of Calibration Certificate

GP-13013-04-04-0204

T. R. R.

Calibration Procedures : CP-NC-03

Calibration Method :

This equipment was calibrated by based on IEC 61010-2:2010 standard for used load level (1.1A).
The stated load level is confirmed and Electrical signal level of frequency weighting with calibration standard and reference standard instruments.

For each result of each item were taken by observation of each instrument display and data with 10 Hz display.

Condition of this result of calibration :

Instrument	Model	Serial No.	Cert. No.	Due Date
Wireless Oscilloscope	33111B	MY1320742	37-001-21	10-06-22
Liquid Multimeter	33461A	MY1320914	331-001-04-0204	10-06-22
Digital Multimeter	33461A	MY1320914	331-001-04-0204	10-06-22
Programmable Resistance	33461A	MY1320914	331-001-04-0204	10-06-22
Measuring Amplifier	33461A	MY1320914	331-001-04-0204	10-06-22

2. This result of calibration was based on the use of the following equipment for this calibration (see table).

3. This certificate is provided by the International System of Units (SI) maintained at:

3.1 National Institute of Standards and Technology (NIST).

3.2 Thailand Institute of Standards and Technology (TIS).

GP-13013-04-04-0204

T. R. R.

Calibration Procedures : CP-NC-03

Calibration Method :

This equipment was calibrated by based on IEC 61010-2:2010 standard.
The stated pressure level, frequency and load capacity of the tested equipment are confirmed using the following methods:

Condition of this result of calibration :

Instrument	Model	Serial No.	Cert. No.	Due Date
Wireless Oscilloscope	33111B	MY1320742	37-001-21	10-06-22
Liquid Multimeter	33461A	MY1320914	331-001-04-0204	10-06-22
Digital Multimeter	33461A	MY1320914	331-001-04-0204	10-06-22
Programmable Resistance	33461A	MY1320914	331-001-04-0204	10-06-22
Measuring Amplifier	33461A	MY1320914	331-001-04-0204	10-06-22
Audio Analyzer	33461A	MY1320914	331-001-04-0204	10-06-22

2. This result of calibration was based on the use of the following equipment for this calibration (see table).

3. This certificate is provided by the International System of Units (SI) maintained at:

3.1 National Institute of Standards and Technology (NIST).

3.2 Thailand Institute of Standards and Technology (TIS).

3. The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k = 2.

at any value following calibration providing a level of confidence of approximately 95 %.

End of Calibration Certificate

GP-13013-04-04-0204

T. R. R.

Calibration Procedures : CP-NC-03

Calibration Method :

This equipment was calibrated by based on IEC 61010-2:2010 standard for used load level (1.1A).
The stated load level is confirmed and Electrical signal level of frequency weighting with calibration standard and reference standard instruments.

For each result of each item were taken by observation of each instrument display and data with 10 Hz display.

Condition of this result of calibration :

Instrument	Model	Serial No.	Cert. No.	Due Date
Wireless Oscilloscope	33111B	MY1320742	37-001-21	10-06-22
Liquid Multimeter	33461A	MY1320914	331-001-04-0204	10-06-22
Digital Multimeter	33461A	MY1320914	331-001-04-0204	10-06-22
Programmable Resistance	33461A	MY1320914	331-001-04-0204	10-06-22
Measuring Amplifier	33461A	MY1320914	331-001-04-0204	10-06-22

2. This result of calibration was based on the use of the following equipment for this calibration (see table).

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3.2 Thailand Institute of Standards and Technology (TIS).

GP-13013-04-04-0204

T. R. R.

Continuation of Calibration Certificate

Summary of Measurement Results:

Parameter	Find	Uncertainty (k=2)	Maximum permitted uncertainty of measurement (MPE)
1. Absolute sensitivity	✓	± 0.2	N/A
2. Self-generated noise	✓	± 0.2	N/A
3. Assembled signal rate of frequency weighting	✓	± 0.2	N/A
4. Displaced signal rate of frequency weighting	✓	± 0.2	N/A
5. Frequency and time weighting at 1 kHz	✓	± 0.2	N/A
6. Frequency and time weighting at 1 kHz	✓	± 0.2	N/A
7. Long-term stability	✓	± 0.2	N/A
8. Level stability at the reference level range	✓	± 0.2	N/A
9. Level stability at the reference level range	✓	± 0.2	N/A
10. Peak C-curve level	✓	± 0.2	N/A
11. Overload indication	✓	± 0.2	N/A
12. High level stability	✓	± 0.2	N/A

QP-7512-04-02004

T. Blah.

Continuation of Calibration Certificate

5. Level stability at the reference level range

Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits
137.0	137.0	0.0	± 0.2
138.0	138.0	0.0	± 0.2
139.0	139.0	0.0	± 0.2
140.0	140.0	0.0	± 0.2
141.0	141.0	0.0	± 0.2
142.0	142.0	0.0	± 0.2
143.0	143.0	0.0	± 0.2
144.0	144.0	0.0	± 0.2
145.0	145.0	0.0	± 0.2
146.0	146.0	0.0	± 0.2
147.0	147.0	0.0	± 0.2
148.0	148.0	0.0	± 0.2
149.0	149.0	0.0	± 0.2
150.0	150.0	0.0	± 0.2
151.0	151.0	0.0	± 0.2
152.0	152.0	0.0	± 0.2
153.0	153.0	0.0	± 0.2
154.0	154.0	0.0	± 0.2
155.0	155.0	0.0	± 0.2
156.0	156.0	0.0	± 0.2
157.0	157.0	0.0	± 0.2
158.0	158.0	0.0	± 0.2
159.0	159.0	0.0	± 0.2
160.0	160.0	0.0	± 0.2

QP-7512-04-02004

T. Blah.

Continuation of Calibration Certificate

Results of calibration:

1. Absolute sensitivity

Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits
93.0 (0.001)	93.0	0.0	± 0.2

2. Self-generated noise

Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits
14.0	14.0	0.0	± 0.2

3. Assembled signal rate of frequency weighting

Mean level (dB) must be within ± 0.2 dB

Frequency (Hz)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits
120	9.1	0.2	± 0.2
1000	9.1	0.0	± 0.2
8000	9.1	0.1	± 0.2

4. Displaced signal rate of frequency weighting

Frequency (Hz)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits
120	9.1	0.2	± 0.2
1000	9.1	0.0	± 0.2
8000	9.1	0.1	± 0.2

5. Frequency and time weighting at 1 kHz

Frequency (Hz)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits
120	9.1	0.2	± 0.2
1000	9.1	0.0	± 0.2
8000	9.1	0.1	± 0.2

QP-7512-04-02004

T. Blah.

Continuation of Calibration Certificate

6. Level stability including the level range control

Range	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits
Auto	94.0	94.0	0.0	± 0.1

7. Time level response

Time	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits
100	94.0	94.0	0.0	± 0.1
200	94.0	94.0	0.0	± 0.1
300	94.0	94.0	0.0	± 0.1
400	94.0	94.0	0.0	± 0.1
500	94.0	94.0	0.0	± 0.1
600	94.0	94.0	0.0	± 0.1
700	94.0	94.0	0.0	± 0.1
800	94.0	94.0	0.0	± 0.1
900	94.0	94.0	0.0	± 0.1
1000	94.0	94.0	0.0	± 0.1

8. Peak C-curve level

Number of cycles	Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits
100	94.0	94.0	0.0	± 0.1
200	94.0	94.0	0.0	± 0.1
300	94.0	94.0	0.0	± 0.1
400	94.0	94.0	0.0	± 0.1
500	94.0	94.0	0.0	± 0.1
600	94.0	94.0	0.0	± 0.1
700	94.0	94.0	0.0	± 0.1
800	94.0	94.0	0.0	± 0.1
900	94.0	94.0	0.0	± 0.1
1000	94.0	94.0	0.0	± 0.1

QP-7512-04-02004

T. Blah.

Continuation of Calibration Certificate

9. Displaced signal rate of frequency weighting

Weighting method response with reference to 1 kHz

Frequency (Hz)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits
120	9.1	0.2	± 0.2
1000	9.1	0.0	± 0.2
8000	9.1	0.1	± 0.2

10. Frequency and time weighting at 1 kHz

Weighting method response with reference to 1 kHz

Frequency (Hz)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits
120	9.1	0.2	± 0.2
1000	9.1	0.0	± 0.2
8000	9.1	0.1	± 0.2

11. Time weighting at 1 kHz

Weighting method response with reference to 1 kHz

Frequency (Hz)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits
120	9.1	0.2	± 0.2
1000	9.1	0.0	± 0.2
8000	9.1	0.1	± 0.2

12. Long-term stability

Weighting method response with reference to 1 kHz

Frequency (Hz)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits
120	9.1	0.2	± 0.2
1000	9.1	0.0	± 0.2
8000	9.1	0.1	± 0.2

QP-7512-04-02004

T. Blah.

Continuation of Calibration Certificate

13. Overload indication

Anticipated Value (dB)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits
137.0	137.0	0.0	± 0.2

14. High level stability

Weighting method response with reference to 1 kHz

Frequency (Hz)	Measured Value (dB)	Deviation Value (dB)	Acceptance Limits
120	9.1	0.2	± 0.2
1000	9.1	0.0	± 0.2
8000	9.1	0.1	± 0.2

The reported uncertainty is based on a standard uncertainty multiplied by coverage factor k = 2

in any value following calibration providing a level of confidence of approximately 95 %

End of Calibration Certificate

QP-7512-04-02004

T. Blah.

Calibration Results : Without Adjustment

Repeatability	
The repeatability of the results of a weighing measurement is determined by the standard deviation of the results of a series of weighings. The results of a series of weighings are shown in the table below. The results of a series of weighings are shown in the table below. The results of a series of weighings are shown in the table below.	
Normal Value (Low Load)	20.0000
Normal Value (High Load)	200.0000
Tolerance	0.0001
Standard Deviation	0.00005

Linearity	
The linearity of the results of a weighing measurement is determined by the deviation of the characteristic curve of a weighing measurement from the linear range. The results of a series of weighings are shown in the table below. The results of a series of weighings are shown in the table below. The results of a series of weighings are shown in the table below.	
Normal Value (Low Load)	20.0000
Normal Value (High Load)	200.0000
Tolerance	0.0001
Standard Deviation	0.00005

0.0001

End of Report.

Certificate of Calibration

Equipment	1 Liquid Bath (Water)
Manufacturer	1 MEMMERT
Model	2 WNR29
Serial No.	1 14110135
Customer Code	1 BKK_250148
ID No.	1 T465544
Customer	1 ALS Laboratory Group (Thailand) Co., Ltd. 104 Phatthanakan 46, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10150
Customer Location	1 ORGANIC PREPARATION LAB
Date of Receipt	1 3 September 2020
Calibrated By	1 Wacharaporn Saengseng (Technician)
Approved By	1 [Signature] Boonchai Sutvisayong (Site Calibration Manager)
Date of Issue	1 11 OCT 2020

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 Institute, which has assessed the measurement capability of the laboratory and its traceability to international standards and to the units of measurement defined at the corresponding national standard laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Metrological Center.

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Approved By	1 [Signature] Boonchai Sutvisayong (Site Calibration Manager)
Date of Issue	1 11 OCT 2020

0.0001

End of Report.

Calibration Report

Equipment	1 Liquid Bath (Water)
Date of Calibration	1 3 September 2020
Environment	1 Temperature : 23.4-23.6 °C 1 Humidity : 23.4-23.6 % 1 Relative Humidity : 55 ± 4% RH
Conditions of this result of calibration	1 The equipment was calibrated by the Metrological Center in accordance with the conditions of accreditation granted by the Thai Laboratory Accreditation Institute, which has assessed the measurement capability of the laboratory and its traceability to international standards and to the units of measurement defined at the corresponding national standard laboratory. This certificate may not be reproduced other than in full except with the prior written approval of the Metrological Center.
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0.0001

End of Report.

Calibration Report

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Date of Calibration	1 3 September 2020
Environment	1 Temperature : 23.4-23.6 °C 1 Humidity : 23.4-23.6 % 1 Relative Humidity : 55 ± 4% RH
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ภาคผนวก จ

สำเนาหนังสืออนุญาตขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

ที่ อก ๐๓๑๐(๑)/ ๑๐๖๙



กรมโรงงานอุตสาหกรรม
ถนนพระรามที่ ๖ เขตราชเทวี
กรุงเทพมหานคร ๑๐๕๐๐

๒๘ มกราคม ๒๕๖๕

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน
ลงวันที่ ๓๐ กรกฎาคม ๒๕๖๓

- สิ่งที่ส่งมาด้วย ๑. รายชื่อผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๑ แผ่น
๒. รายชื่อเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๕ แผ่น
๓. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๑ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุ
หนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔
ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร
ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย)
จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

- ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย ตามสิ่งที่ส่งมาด้วย ๑
ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๖๒ ราย ตามสิ่งที่ส่งมาด้วย ๒
ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย จำนวน ๕๙ รายการ น้ำใต้ดิน
จำนวน ๑๒๖ รายการ อากาศเสีย ๑๖ รายการ สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน ๓๕ รายการ และดิน
จำนวน ๑๒๕ รายการ รวมทั้งสิ้นจำนวน ๓๖๑ รายการ ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ กันยายน ๒๕๖๖ หากประสงค์จะต่ออายุหนังสือ
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอ
ต่อกรมโรงงานอุตสาหกรรม ภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์
เอกชน ซึ่งคำขอต่ออายุดังกล่าวขอรับได้ที่กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายศิริระ จันทรเจต)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน
ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๒๐๒ ๔๑๔๖ ๐ ๒๒๐๒ ๔๐๐๒

โทรสาร ๐ ๒๓๕๔ ๓๒๐๘ ๐ ๒๓๕๔ ๓๔๑๕

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

เลขทะเบียน ว-๒๐๔

ที่ อก ๐๓๑๐(๑)/

ลงวันที่ ๒๘ มกราคม ๒๕๖๕

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย

๑) นางสาวยุพาพร จันทร์เปล่ง

ทะเบียนเลขที่ ว-๒๐๔-ค-๔๗๐๐

๒) นางสาวชัชชัย โกมารกุล ณ นคร

ทะเบียนเลขที่ ว-๒๐๔-ค-๔๗๐๑

๓) นายศรายุทธ จิตรานนท์

ทะเบียนเลขที่ ว-๒๐๔-ค-๔๗๐๒

๔) นางสาวกนกกร เอนก

ทะเบียนเลขที่ ว-๒๐๔-ค-๖๑๑๑

๕) นายสุริยา สอนแก้ว

ทะเบียนเลขที่ ว-๒๐๔-ค-๖๑๑๒

๖) นายวิชาญ ชูณหะวัณ

ทะเบียนเลขที่ ว-๒๐๔-ค-๖๑๑๓



(นายศิริระ จันทร์เจิด)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แล็บอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

เลขทะเบียน ว-๒๐๔

ที่ อก ๐๓๑๐(๑)/ ๑๐๖๙

ลงวันที่ ๒๘ มกราคม ๒๕๖๕

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๖๒ ราย

๑) นางสาวจินดา ไชจุลธรรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๐๘
๒) นางสาวสาวิตรี น้อยเสงี่ยม	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๐๙
๓) นางสาวชนัญฎาญจน์ อัมขม	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๐
๔) นางสาวนรินทร์ สายเส็ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๕
๕) นางสาวนันทวดี สมบูรณ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๖
๖) นางสาวศรัณยา เฉลิมธำรงค์	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๗
๗) นางสาวสรารัศมี มงคลจิรวุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๑๙
๘) นางสาวศิริลักษณ์ พึ่งแพง	ทะเบียนเลขที่ ว-๒๐๔-จ-๔๗๒๐
๙) นายณพพงศ์ จันทรพันธุ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๐๘
๑๐) นายนรเศรษฐ์ โกมลย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๑๑
๑๑) นายธันวา จริยา	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๑๔
๑๒) นางสาวเกศรินทร์ แก้วมัน	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๑๖
๑๓) นางสาวสุวิมล ชัยเรืองวุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๑๗
๑๔) นางสาวสุชาดา ธรรมถาวร	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๑
๑๕) นางสาวเปมิกา ชัยเดชธนกุล	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๓
๑๖) นางสาวศศิธร หมูสวัสดิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๔
๑๗) นางสาวเสาวลักษณ์ ภู่นาอำพร	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๕
๑๘) นายอภิสิทธิ์ สิงหา	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๖
๑๙) นายศักดิ์สิทธิ์ ไพศาลพิสุทธิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๗
๒๐) ว่าที่ร้อยตรีหญิง พรรณีภา ขำเจริญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๒๘
๒๑) นางจิตดา คำภูแก้ว	ทะเบียนเลขที่ ว-๒๐๔-จ-๕๔๓๑
๒๒) นางสาวอรรวรรณ รักยง	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๑๕
๒๓) นางสาวนพรัตน์ แยมกรานต์	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๑๙
๒๔) นายจุลเดช วารินทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๐
๒๕) นางสาวดาญรัตน์ ร้องคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๑
๒๖) นายนคร สุขเจริญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๒
๒๗) นายบัญชา นามเขตต์	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๓
๒๘) นายพรมมี ศรีปัดเนตร	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๕
๒๙) นายอุทิศ อุ่นสิม	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๖
๓๐) ว่าที่ร้อยตรี เฉลิมเกียรติ อมรศรีเสริม	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๘
๓๑) นางสาววริยา สร้างนา	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๒๙
๓๒) นายอนุพงศ์ รัตนศรีประเสริฐ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๓๐
๓๓) นางสาวจุฑารัตน์ โอนสันเทียะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๖๑๔๒
๓๔) นางสาวจรรววรรณ พิมพ์อริกฤติยา	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๗๖

(นายศิระ จันทร์เจิด)

๓๕) นางสาวปรารค์ทิพย์...

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

สำนักงานสิ่งแวดล้อมและเฝ้าระวังมลพิษ

๓๕) นางสาวปรางค์ทิพย์ กิจไพศาลศักดิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๗๙
๓๖) นางสาวเตือนใจ ทางกลาง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๐
๓๗) นางสาวจิราพร ศิริเวช	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๑
๓๘) นายวรกร ผุ้กรักษ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๓
๓๙) นายทง วิริยะสทกิจ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๔
๔๐) นายธนิธ เจนจบ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๕
๔๑) นายคณิศร ขำเพชร	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๖
๔๒) นายอรรคพล นิยมวิทยาพันธ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๗
๔๓) นายภูวิช พรหมสะอาด	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๘
๔๔) นายธนเดช โภคาพิพัฒน์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๘๙
๔๕) นายชวฤทธิ์ วงษ์จันทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๐
๔๖) นายอาทิตย์ ศรีเสน	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๑
๔๗) นายเจษดินทร์ คงศักดิ์ไทย	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๒
๔๘) นายจรัส บุญยิ่ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๕
๔๙) นายธนาณัติ เอนก	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๖
๕๐) นายอภิวัฒน์ ทุมหนู	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๗
๕๑) นางสาวสุภาขวัญ มาก	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๐๙๘
๕๒) นางสาวทัตพร ขวาลสมบูรณ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๐
๕๓) นางสาวธิดิมา บุญเพ็ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๑
๕๔) นางสาวกนกอร เข้มเพ็ชร	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๒
๕๕) นางสาวพัชรียา หงษ์สมดี	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๓
๕๖) นางสาวภาณิดา สุรวงศ์ตระกูล	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๔
๕๗) นางสาวภาณุมาศ นามวัฒน์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๕
๕๘) นางสาวอุไรรัตน์ ทิงสร้างแป้น	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๖
๕๙) นายธีรวัฒน์ ปวงสุข	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๗
๖๐) นายอิทธิพล ยะโส	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๘
๖๑) นายประพจน์ วรรณชูชัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๐๙
๖๒) นายชยธร พวงทิพย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๐
๖๓) นางสาวกนกวรรณ จันทบาล	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๑
๖๔) นางสาวเกษร หลักบุญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๒
๖๕) นายสิทธิโชค ธงเงิน	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๑๑๓
๖๖) นางศิวารณ ใจบุญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๐๕
๖๗) นางสาวพรรณธิดา พุ่มคง	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๐๘
๖๘) นางสาวศรณีย์ ยิ่งดี	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๐๙
๖๙) นายนวกัทร ศรีวิริยะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๐
๗๐) นายสุวิชา ทองอ่อน	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๑
๗๑) นายวิญญู บุญตะนัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๓

(นายศิระ จันทรเจ็ด)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

ปณิธานของกรมส่งเสริมการค้าระหว่างประเทศ

๗๒) นายสมบูรณ์...

๗๒) นายสมบุรณ์ บุตรจันทร์
๗๓) นายวิรัตน์ ไชยชนะรา
๗๔) นายนฤเบศน์ เพิ่มพูน
๗๕) นายจิรณัฐ ขาวละออ
๗๖) นายสมโภช วันสา
๗๗) นายอัสรี นามบุรี
๗๘) นายณัฐนันท์ ปานประเสริฐ
๗๙) นายอัครเศรฐ จ่อสาว
๘๐) นายประเสริฐ สุระพันธ์
๘๑) นายอนุกุล จันทรเนียม
๘๒) นายพิรพงษ์ ทองคุณปรีดา
๘๓) นายนฤพล ทองนุช
๘๔) นายอนุวัฒน์ ม่วงแพ
๘๕) นายเจตศราวุฒิ ปัตตะมะ
๘๖) นายกฤษณะ สายวรรณ
๘๗) นายพิชัย บุญยงค์
๘๘) นายภานุพงศ์ โหมวงศ์
๘๙) นายสามารถ คัมปลี
๙๐) นายสัญญาชัย โกศรีนาม
๙๑) นายณัฐวุฒิ ศรีประเสริฐ
๙๒) นายชวัลรัช นาคพนม
๙๓) นายพงศธร ชัยทิพย์
๙๔) ว่าที่ร้อยตรี ภาณุพงศ์ แสนศรี
๙๕) นายสิทธิโชค ทาสีดา
๙๖) นายธนากร อินสุตา
๙๗) นางสาววรรณิษา ขาติวันชัย
๙๘) นางสาวพิมพ์ตะวัน มินากุล
๙๙) นางสาวเพชรรัตน์ สิงห์สมบุญ
๑๐๐) นางสาวชญาณิน พรหมจันทร์
๑๐๑) นายกীরติ ทวีราช
๑๐๒) นายจักริน หมั่นวิชา
๑๐๓) นายฉัตรชัย สุขเปี้ย
๑๐๔) นายณรรนท ต๊ะทองคำ
๑๐๕) นายดุลยพล สนนอก
๑๐๖) นายทักษ์ดนัย อุบลศรี
๑๐๗) นายธนศร นามะกฤษณา
๑๐๘) นายธิตีพงศ์ บัวแดง

ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๔
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๕
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๖
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๗
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๘
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๑๙
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๐
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๑
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ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๔
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๒๕
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ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๓
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๔
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ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๘
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๓๙
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๐
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ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๓
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๔
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๕
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๖
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ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๘
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๔๙
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๕๐
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๕๑
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๕๒
ทะเบียนเลขที่ ว-๒๐๔-จ-๗๕๕๓

(นายศิระ จันทรเจ็ด)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

ปภังกรอุตสาหกรรม

๑๐๙) นายนนทชัย...

๑๐๙) นายพนนพชัย อุปถัมภ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๔
๑๑๐) นายณัฐพล คุณสุทธิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๕
๑๑๑) นายณัฏฐวัฒน์ สาริน	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๖
๑๑๒) นายปิยะนัฐ พลมะศรี	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๗
๑๑๓) นายพงศ์สิริ โสมเขียว	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๘
๑๑๔) นายพีรพัฒน์ กำคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๕๙๙
๑๑๕) นายภาณุพงศ์ มานิตย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๐
๑๑๖) นายมงคล ผลาทิพย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๑
๑๑๗) นายมนุรินทร์ พูลศิริ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๒
๑๑๘) นายสิรินันท์ ทองอ้น	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๓
๑๑๙) นายอเนชา ทันสมัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๔
๑๒๐) นายอดิศักดิ์ ผมไผ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๕
๑๒๑) นายอนันตชัย วิสม	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๖
๑๒๒) นายณัฐดนัย เจือละออง	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๗
๑๒๓) นายวรวิธ ดินัก	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๘
๑๒๔) นายแสงตะวัน นະตะສັດ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๐๙
๑๒๕) นายยุทธพงศ์ รัตนะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๐
๑๒๖) นายชัยณัฐ ไซยะนิจ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๑
๑๒๗) นายวิศรุต ศรีธรรมมา	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๒
๑๒๘) นายพนนทกร เพ็ญผ่อง	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๓
๑๒๙) นายกำชัย สุทธะ	ทะเบียนเลขที่ ว-๒๐๔-จ-๘๖๑๔
๑๓๐) นางสาวณัฐภรณ์ รักทะเล	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๑๙
๑๓๑) นางสาวประภาภรณ์ บุตรพรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๐
๑๓๒) นางสาวนิลาวัลย์ นามพรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๑
๑๓๓) นางสาวพัชรินทร์ แสนสร้อย	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๒
๑๓๔) นายไพโรจน์ เปี่ยมพิมาย	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๓
๑๓๕) นางสาวศุภมาศ ทองมาก	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๔
๑๓๖) นางสาวลลิตา จิตรสว่าง	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๕
๑๓๗) นางสาวชไมพร เสิกัญเขียว	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๖
๑๓๘) นางสาวกฤติมาพร คำมีแก่น	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๗
๑๓๙) นางสาวสกุลรัตน์ ภาควุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๘
๑๔๐) นางสาวกาญจนา คงคุณ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๒๙
๑๔๑) นางสาวไพรินทร์ ศรีรูปี	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๐
๑๔๒) นางสาวทิพนันดา ฝูญปัญญา	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๑
๑๔๓) นางสาวสาธิตา ปานทอง	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๒
๑๔๔) นางสาวอริสา ทองนวล	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๓
๑๔๕) นางสาวอริยา คำคลอง	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๔

(นายศิระ จันทร์เจิด)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

๑๔๖) นางสาวบุษดาภรณ์...

๑๔๖) นางสาวชุตานกรณ์ สุนทรสนาน	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๕
๑๔๗) นางสาวสุภารัตน์ นนท์ประสาท	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๖
๑๔๘) นางสาวรัชนีกร เนียมกลาง	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๗
๑๔๙) นางสาวกัญญารัตน์ ศรีนิลทา	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๘
๑๕๐) นางสาวอัญชลี คำจันทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๓๙
๑๕๑) นายบุญฤทธิ์ เอี่ยมเทศ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๐
๑๕๒) นายศิริวัฒน์ พานิชย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๑
๑๕๓) นางสาวศุภรดา ปันมยุรา	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๒
๑๕๔) นางสาวพาฤดี คุณนาน	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๓
๑๕๕) นางสาวจิราเจต พองดา	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๔
๑๕๖) นางสาวกนกภรณ์ อุระ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๕
๑๕๗) นางสาวอารยา มีชัย	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๖
๑๕๘) นางสาวจิตสุภา ประเทืองสุข	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๗
๑๕๙) นางสาวอริสา วิริยขันติธรรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๘
๑๖๐) นางสาววิชุดา นาคผจญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๔๙
๑๖๑) นางสาวพนิดา ยอดอินทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๕๐
๑๖๒) นางสาวนันทิยา จันทะลุน	ทะเบียนเลขที่ ว-๒๐๔-จ-๙๒๕๑



(นายศิริระ จันทรเจติ)

นักวิทยาศาสตร์ชำนาญการพิเศษ รักษาการแทน

ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน

ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

เลขทะเบียน ว-๒๐๔

ที่ อก ๐๓๑๐(๑)/ ๑๐๖๕

ลงวันที่ ๒๘ มกราคม ๒๕๖๕

ขอขยายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๖๑ รายการ

น้ำเสีย จำนวน 59 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldicarb	High-Performance Liquid Chromatographic Method ^[4]
2	Aldicarb Sulfone	High-Performance Liquid Chromatographic Method ^[4]
3	Aldicarb Sulfoxide	High-Performance Liquid Chromatographic Method ^[4]
4	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
5	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
6	Barium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
7	α -BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
8	β -BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
9	δ -BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
10	γ -BHC	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
11	Biochemical Oxygen Demand	1) 5-Day BOD Test, Azide Modification Method ^[4] 2) 5-Day BOD Test, Membrane Electrode Method ^[4]
12	Carbaryl	High-Performance Liquid Chromatographic Method ^[4]
13	Carbofuran	High-Performance Liquid Chromatographic Method ^[4]
14	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
15	Chemical Oxygen Demand	1) Closed Reflux, Colorimetric Method ^[4] 2) Closed Reflux, Titrimetric Method ^[4]
16	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
17	Chromium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[4]
18	Color	ADMI Weighted-Ordinate Spectrophotometric Method



(นางริกาญจน์ จิตรสกุลไชย)

19 Copper...

ผู้อำนวยการกลุ่มมาตรฐานวิชาการวิเคราะห์ทดสอบมลพิษ

และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
19	Copper	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
20	Cyanide	Distillation, Colorimetric Method ^[4]
21	2,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
22	4,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
23	2,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
24	4,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
25	2,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
26	4,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
27	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
28	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
29	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
30	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
31	Endrin	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
32	Endrin Aldehyde	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
33	Formaldehyde	Distillation, Colorimetric Method ^[3]
34	Free Chlorine	1) DPD Ferrous Titrimetric Method ^[4] 2) Iodometric Method ^[4]
35	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
36	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
37	Hexavalent Chromium	Filtration, Colorimetric Method ^[4]
38	3-Hydroxycarbofuran	High-Performance Liquid Chromatographic Method ^[4]
39	Lead	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
40	Manganese	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
41	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[4] 2) Digestion, Inductively Coupled Plasma/Mass spectrometric Method ^[4]
42	Methiocarb	High-Performance Liquid Chromatographic Method ^[4]
43	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]

วิมล

44 Methomyl...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
44	Methomyl	High-Performance Liquid Chromatographic Method ^[4]
45	Nickel	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
46	Oil & Grease	1) Liquid-Liquid, Partition-Gravimetric Method ^[4] 2) Soxhlet Extraction Method ^[4]
47	Oxamyl	High-Performance Liquid Chromatographic Method ^[4]
48	Propoxur	High-Performance Liquid Chromatographic Method ^[4]
49	pH	Electrometric Method ^[4]
50	Phenols	1) Distillation, Chloroform Extraction Method ^[4] 2) Distillation, Direct Photometric Method ^[4]
51	Selenium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
52	Sulfide	Iodometric Method ^[4]
53	Temperature	Laboratory and Field Methods ^[4]
54	Total Dissolved Solids	Dried at 180 °C ^[4]
55	Total Kjeldahl Nitrogen	Semi-Micro Kjeldahl Method ^[4]
56	Total Suspended Solids	Dried at 103-105 °C ^[4]
57	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic Method ^[4]
58	Trivalent Chromium	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation ^[4]
59	Zinc	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[4]

น้ำใต้ดิน จำนวน 126 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
2	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]

วิมล

3 Aldrin...

(นางริภาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
3	Aldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
4	Anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
5	Antimony	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
7	Atrazine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
8	Barium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
9	Benz(a)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
11	Benzo(b)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
12	Benzo(k)fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
13	Benzoic Acid	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
14	Benzo(a)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
15	Benzo[g,h,i]perylene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
17	Bis(2-chloroethyl)ether	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]

วิธีทาง)

18 Bis(2-ethylhexyl)phthalate...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
		Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ^[4]
22	Butyl Benzyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
27	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
33	Chromium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]



34 Chromium (III)...

(นางริกาญจน์ จิตรสกุลไธ)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
57	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
58	Diethyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
63	Di-n-Octyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
64	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
65	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
67	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]



(นางริกาญจน์ จิตรสกุลไชย)

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และทะเบียนห้องปฏิบัติการ

68 Fluorene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
68	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
69	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
70	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
73	n-Hexane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
74	α -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
75	β -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
76	γ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
79	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
81	Lead	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
82	Manganese	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
83	Mercury	1) Cold Vapor Atomic Absorption Spectrometric Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]

วิมล

84 Methanol...

(นางริกาญจน์ ฉัตรสกุลวิไล)

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และหน่วยงานที่เกี่ยวข้อง

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
84	Methanol	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4] 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ^[4]
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
89	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
91	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
92	Nickel	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
95	N-Nitrosodi-n-Propylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
96	Polychlorinated Biphenyls - PCB 1016 - PCB 1221 - PCB 1232 - PCB 1242 - PCB 1248 - PCB 1254 - PCB 1260	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]

วิมล

97 Pentachlorophenol...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
98	pH	Electrometric Method ^[4]
99	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
100	Phenol	1) Distillation, Direct Photometric Method ^[4] 2) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
101	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
102	Selenium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
103	Silver	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
104	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
105	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
106	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
107	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
108	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
109	TPH (C ₅ -C ₈)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[13,24]
110	TPH (C _{>8} -C ₁₆)	Solvent Extraction, Gas Chromatographic Method ^[9,21]
111	TPH (C _{>16} -C ₃₅)	Solvent Extraction, Gas Chromatographic Method ^[9,21]
112	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
113	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]

วิมล

114 1,1,2-Trichloroethane...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
114	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
115	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
116	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
117	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[4]
118	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
119	Vanadium	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]
120	Vinyl Acetate	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
121	Vinyl Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
122	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
123	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
124	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
125	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[4]
126	Zinc	1) Digestion, Inductively Coupled Plasma Method ^[4] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[4]

อากาศเสีย (ปล่อยระบาย) จำนวน 16 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]
2	Arsenic	Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]

วิฑูรย์

3 Carbon Monoxide...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และหน่วยงานที่เกี่ยวข้อง

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
3	Carbon Monoxide	1) Sampling Bag Non-Dispersive Infrared Method ^[5] 2) Non-Dispersive Infrared Method ^[5] 3) Instrumental Analyzer Method ^[5]
4	Chlorine	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5]
5	Copper	Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]
6	Dioxins	Isokinetic Sampling, Analysis by ISO/IEC 17025 Accredited Laboratory or Analysis by Department of Industrial Works Registered Laboratory (Dioxins/Furans Analysis Approved) ^[5]
7	Hydrogen Chloride	1) Absorption Sampling, Ion Chromatographic Method ^[5] 2) Isokinetic Sampling, Ion Chromatographic Method ^[5]
8	Hydrogen Sulfide	Absorption Sampling, Iodometric Method ^[5]
9	Lead	Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]
10	Mercury	1) Isokinetic Sampling, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[5] 2) Isokinetic, Digestion, Inductively Coupled Plasma Method ^[5]
11	Opacity	Ringelmann's Method ^[2]
12	Oxides of Nitrogen	1) Absorption Sampling, Phenoldisulfonic Acid Method ^[5] 2) Chemiluminescence Method ^[5] 3) Instrumental Analyzer Method ^[5]
13	Sulfur Dioxide	1) Absorption Sampling, Barium-Thorin Titrimetric Method ^[5] 2) UV Fluorescence Method ^[5] 3) Instrumental Analyzer Method ^[5]
14	Sulfuric Acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method ^[5]
15	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method ^[5]
16	Xylene	Adsorption Sampling, Gas Chromatographic Method ^[5]

วิมล

สิ่งปลูก...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิชาการวิเคราะห์ทดสอบมลพิษ

กรมควบคุมมลพิษ

สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 35 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]



6 Cadmium...

(นางริกาญจน์ จิตรสกุลไธ)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,19,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
8	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
9	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation Method ^[1,6,15,17] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method ^[1,6,16,17] 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^[7,8,15,17] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^[7,8, 16,17]
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method ^[1,6,17] 2) Alkaline Digestion, Colorimetric Method ^[8,17]



(นางริกาญจน์ จิตรสกุลไชย)

11 Cobalt...

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

.....เรียน...../.....

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
11	Cobalt	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
12	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
13	2,4-D	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25]

วิมล

2) Soxhlet...

(นางริภาญจน์ จัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และทะเบียนห้องปฏิบัติการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	Dieldrin	2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31] 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25]
18	Endrin	2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31] 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25]
19	Heptachlor	2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31] 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25]
20	Lead	2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31] 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16]
21	Lindane	3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16] 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22]
22	Mercury	3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31] 1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[1,6,18]

วิมล

2) Waste Extraction...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
23	Methoxychlor	2) Waste Extraction, Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method ^[1,6,19] 3) Waste Extraction, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ^[1,6,20] 4) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[18] 5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method ^[19] 6) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ^[20]
24	Mirex	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
25	Molybdenum	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
26	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
		1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]

วิภากร

27 Polychlorinated...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
27	<p>Polychlorinated biphenyls (PCBs)</p> <ul style="list-style-type: none"> - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260 - 2-Chlorobiphenyl - 2,3-Dichlorobiphenyl - 2,2',5-Trichlorobiphenyl - 2,4',5-Trichlorobiphenyl - 2,2',3,5'-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,3',4,4'-Tetrachlorobiphenyl - 2,2',3,4,5'-Pentachlorobiphenyl - 2,2',4,5,5'-Pentachlorobiphenyl - 2,3,3',4',6-Pentachlorobiphenyl - 2,2',3,4,4',5'-Hexachlorobiphenyl - 2,2',3,4,5,5'-Hexachlorobiphenyl - 2,2',3,5,5',6-Hexachlorobiphenyl - 2,2',4,4',5,5'-Hexachlorobiphenyl - 2,2',3,3',4,4',5-Heptachlorobiphenyl - 2,2',3,4,4',5,5'-Heptachlorobiphenyl - 2,2',3,4,4',5',6-Heptachlorobiphenyl - 2,2',3,4',5,5',6-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl 	<p>1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method^[1,9,23]</p> <p>2) Soxhlet Extraction, Gas Chromatographic Method^[10,23]</p> <p>3) Automated Soxhlet Extraction, Gas Chromatographic Method^[22,31]</p>

วิมล

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

28 Pentachlorophenol...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
28	Pentachlorophenol	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
29	pH	Electrometric Method ^[29,30]
30	Selenium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
31	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16]
32	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
33	Toxaphene	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method ^[1,9,25] 2) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 3) Automated Soxhlet Extraction, Gas Chromatographic Method ^[22,31]
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15]

วิมล

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิชาการวิเคราะห์ทดสอบมลพิษ

4) Digestion...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
35	Zinc	4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16] 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method ^[1,6,15] 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[1,6,16] 3) Digestion, Inductively Coupled Plasma Method ^[7,15] 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]

ดิน จำนวน 125 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
2	Acetone	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
3	Aldrin	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
4	Anthracene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
5	Antimony	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
6	Arsenic	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
7	Atrazine	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
8	Barium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]



(นางริกาญจน์ นัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

9 Benz(a)anthracene...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
9	Benz(a)anthracene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
10	Benzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
11	Benzo(b)fluoranthene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
12	Benzo(k)fluoranthene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
13	Benzoic acid	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
14	Benzo(a)pyrene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
15	Benzo(g,h,i)perylene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
16	Beryllium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
17	Bis(2-chloroethyl)ether	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
18	Bis(2-ethylhexyl)phthalate	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
21	Butanol	Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method ^[12,24]
22	Butyl Benzyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
24	Carbazole	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]

วิมล

26 Carbon tetrachloride...

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
27	Chlordane	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
28	p-Chloroaniline	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
32	2-Chlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
33	Chromium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^[7,8,15,17] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method ^[7,8,16,17]
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method ^[8,17]
36	Chrysene	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
37	Cyanide	Extraction, Distillation, Colorimetric Method ^[26,27,28]
38	2,4-D	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
39	DDD	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]

วิฑูรย์

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิชาการวิเคราะห์ทดสอบมลพิษ

40 DDE...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
40	DDE	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
41	DDT	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
42	Dibenz(a,h)anthracene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
43	Di-n-Butyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
47	3,3-Dichlorobenzidine	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
53	2,4-Dichlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]

วิภาณี

(นางริกาญจน์ ฉัตรสกุลวิไล)

57 Dieldrin...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
57	Dieldrin	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
58	Diethyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
59	2,4-Dimethylphenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
60	2,4-Dinitrophenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
61	2,4-Dinitrotoluene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
62	2,6-Dinitrotoluene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
63	Di-n-Octyl Phthalate	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
64	Endosulfan	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
65	Endrin	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
67	Fluoranthene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
68	Fluorene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
69	Heptachlor	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
70	Heptachlor Epoxide	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
71	Hexachlorobenzene	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
73	n-Hexane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
74	α -HCH	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
75	β -HCH	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
76	γ -HCH	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
77	Hexachlorocyclopentadiene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
78	Hexachloroethane	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
79	Indeno(1,2,3-cd)pyrene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
80	Isophorone	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
81	Lead	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
82	Manganese	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method ^[18]



(นางริกาญจน์ จิตตรัสกุลไธ)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

และหน่วยงานห้องปฏิบัติการ

2) Thermal...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
84	Methanol	2) Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry ^[19] 3) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method ^[20] Equilibrium Headspace, Gas Chromatographic/Mass Spectrometric Method ^[12,24]
85	Methoxychlor	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
86	Methyl Bromide	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
87	Methylene Chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
88	2-methylphenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
89	2-Methylnaphthalene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
90	Methyl tert-Butyl Ether	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method ^[14,24]
91	Naphthalene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
92	Nickel	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method ^[7,16]
93	Nitrobenzene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
94	N-Nitrosodiphenylamine	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
95	N-Nitrosodi-n-propylamine	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
96	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,23] 2) Automated Soxhlet Extraction, Gas Chromatographic Method ^[23,32]

วิฑูรย์

(นางริกาญจน์ ฉัตรสกุลวิไล)

- Aroclor 1242...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
	<ul style="list-style-type: none"> - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260 - 2-Chlorobiphenyl - 2,2',3,5'-Tetrachlorobiphenyl - 2,2',5,5'-Tetrachlorobiphenyl - 2,3',4,4'-Tetrachlorobiphenyl - 2,2',3,4,5'-Pentachlorobiphenyl - 2,2',4,5,5'-Pentachlorobiphenyl - 2,3,3',4',6-Pentachlorobiphenyl - 2,2',3,4,4',5'-Hexachlorobiphenyl - 2,2',3,4,5,5'-Hexachlorobiphenyl - 2,2',3,5,5',6-Hexachlorobiphenyl - 2,2',4,4',5,5'-Hexachlorobiphenyl - 2,2',3,3',4,4',5-Heptachlorobiphenyl - 2,2',3,4,4',5,5'-Heptachlorobiphenyl - 2,2',3,4,4',5',6-Heptachlorobiphenyl - 2,2',3,4',5,5',6-Heptachlorobiphenyl - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl 	
97	Pentachlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
98	Phenanthrene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
99	Phenol	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]
100	Pyrene	Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method ^[25,31]

วิกรม

(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ
และทะเบียนห้องปฏิบัติการ

101 Selenium...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
101	Selenium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
102	Silver	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
103	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
106	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
107	Toxaphene	1) Soxhlet Extraction, Gas Chromatographic Method ^[10,22] 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
108	TPH (C ₅ -C ₈)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
109	TPH (C ₈ - C ₁₆)	1) Solvent Extraction, Gas Chromatographic Method ^[11,21] 2) Automated Soxhlet Extraction, Gas Chromatographic Method ^[21,31]
110	TPH (C ₁₆ - C ₃₅)	1) Solvent Extraction, Gas Chromatographic Method ^[11,21] 2) Automated Soxhlet Extraction, Gas Chromatographic Method ^[21,31]
111	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
114	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
115	2,4,5-Trichlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]

วิมล

116 2,4,6-Trichlorophenol...

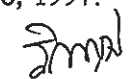
(นางริกาญจน์ ฉัตรสกุลวิไล)

ผู้อำนวยการกลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
116	2,4,6-Trichlorophenol	Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method ^[25,31]
117	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
118	Vanadium	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]
119	Vinyl Acetate	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
120	Vinyl Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
121	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
122	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
123	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
124	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method ^[14,24]
125	Zinc	1) Digestion, Inductively Coupled Plasma Method ^[7,15] 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method ^[7,16]

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