

ภาคผนวก ค

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ใบรับรองผลการตรวจวิเคราะห์

ภาคผนวก ค-1

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ผลการตรวจวิเคราะห์คุณภาพน้ำทิ้ง





## Analysis / Test Report

TESTING

No.0166

Client : WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

P/O :

Project Name :

Project Location :

Lot ID: 24122215

Date Received : Oct 25, 2024

Date Reported : Nov 05, 2024

Report Number : 3146639-1

Page 1 of 9

Sample Number	24122215-1
Sampled Date	Oct 25, 2024 1:15 PM
Sample Description	น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้
Location	ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)
Date Analysis Commenced	Oct 25, 2024
Condition of Sample	Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Metals Testing</b>							
Arsenic	mg/L	0.001	0.005	0.006	≤0.25	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Barium	mg/L	0.001	0.005	0.04	≤1.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Cadmium	mg/L	0.001	0.005	Not Detected	≤0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Chromium	mg/L	0.001	0.005	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Copper	mg/L	0.001	0.005	Not Detected	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Hexavalent Chromium	mg/L	0.005	0.01	Not Detected	≤0.25	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3500-Cr B	Songkhla
Iron	mg/L	0.001	0.005	0.12	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla

Approved by

Ananta B.

Ananta Boonphet  
Scientist (2)

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<b>Metals Testing</b>							
Lead	mg/L	0.001	0.005	Not Detected	≤0.2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Manganese	mg/L	0.001	0.005	0.77	≤5.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Mercury	mg/L	0.0003	0.0005	Not Detected	≤0.005	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Nickel	mg/L	0.001	0.005	Not Detected	≤1.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Selenium	mg/L	0.001	0.005	Not Detected	≤0.02	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Silver	mg/L	0.001	0.005	Not Detected	≤1.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Trivalent Chromium *	mg/L	-	0.01	<0.01	≤0.75	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla

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Ananta B.

Ananta Boonphet  
Scientist (2)

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31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**Lot ID: 24122215**

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**Location** ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)  
**Date Analysis Commenced** Oct 25, 2024  
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Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Metals Testing</b>							
Zinc	mg/L	0.001	0.005	0.006	≤5.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B, 3030 F	Songkhla
<b>Pesticides - Organochlorine Group</b>							
<sup>[A]</sup> 2,4-DDD	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<sup>[A]</sup> 2,4-DDE	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<sup>[A]</sup> 2,4-DDT	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<sup>[A]</sup> 4,4-DDD	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<sup>[A]</sup> 4,4-DDE	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok

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**Date Analysis Commenced** Oct 25, 2024  
**Condition of Sample** Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Pesticides - Organochlorine Group</b>							
<sup>[A]</sup> 4,4-DDT	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<sup>[A]</sup> Aldrin	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<sup>[A]</sup> alpha-BHC	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<sup>[A]</sup> beta-BHC	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<sup>[A]</sup> Chlordane	ug/L	0.02	0.04	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<sup>[A]</sup> delta-BHC	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok

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**Condition of Sample** Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Pesticides - Organochlorine Group</b>							
<sup>[A]</sup> Dieldrin	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<sup>[A]</sup> Endosulfan	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<sup>[A]</sup> Endosulfan I	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<sup>[A]</sup> Endosulfan II	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<sup>[A]</sup> Endrin	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<sup>[A]</sup> Endrin aldehyde	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok

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Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Pesticides - Organochlorine Group</b>							
<sup>[A]</sup> gamma-BHC (Lindane)	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<sup>[A]</sup> Heptachlor	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<sup>[A]</sup> Heptachlor-Epoxide	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<sup>[A]</sup> Methoxychlor	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<sup>[A]</sup> Mirex	ug/L	0.01	0.02	Not Detected	Not Detected	In-house method : STM 04-101 based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<b>Water Testing</b>							
Anionic Surfactant as MBAS *	mg/L	0.015	0.05	0.48	≤30	Based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5540 B, C	Bangkok

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Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
BOD (5 days at 20 degree C)	mg/L	-	2.0	18.7	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Songkhla
COD	mg/L	-	25	103	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Songkhla
Color (at Original pH) *	ADMI	-	5	16	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Songkhla
Color (at pH 7.0) *	ADMI	-	5	11	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Songkhla
<sup>[A]</sup> Cyanide as CN	mg/L	0.002	0.005	Not Detected	≤0.2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - CN (C, E)	Bangkok
Fluoride as F *	mg/L	0.15	0.5	1.2	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-F (D)	Bangkok
Formaldehyde *	mg/L	-	0.1	<0.1	≤1	Wastewater analysis manual, Environmental Engineering Association of Thailand, 4th ed., 2004	Songkhla
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Songkhla

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Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
pH at 25 degree C		-	-	8.2	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Songkhla
Phenol	mg/L	0.004	0.01	Not Detected	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5530 D	Songkhla
Residual Free Chlorine	mg/L	-	0.1	0.2	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Songkhla
Sulfide *	mg/L	-	0.5	<0.5	≤1.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-S2 (C, F)	Songkhla
Temperature *	Degree C	-	-	28.7	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Songkhla
Total Dissolved solids Dried at 180 degree C	mg/L	-	5	2400	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Songkhla
Total Kjeldahl Nitrogen as N *	mg/L	0.15	1.0	18.1	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Norg (C)	Bangkok
Total Suspended Solids	mg/L	-	5	20	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Songkhla

**Guideline :** Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

Approved by

Ananta B.

Ananta Boonphet  
Scientist (2)

Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. No part of this report may be reproduced in any form without written consent from the laboratory. ALS Laboratory Group (Thailand) strongly recommends that this report is not reproduced except in full.

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## Analysis / Test Report

TESTING

No.0166

**Lot ID: 24122215**

Date Received : Oct 25, 2024

Date Reported : Nov 05, 2024

Report Number : 3146639-1

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :**

**Project Name :**

**Project Location :**

Page 9 of 9

**Remark :**

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.
- [A] Analysis conducted by ALS Laboratory Group (Thailand) Co.,Ltd. Bangkok Branch, DSS Accreditation No. 0009.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Approved by

Ananta B.

Ananta Boonphet  
Scientist (2)

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## Analysis / Test Report

TESTING  
No.0166

**Client :** WMS Depot Co., Ltd.  
31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**Lot ID: 24122221**

Date Received : Nov 19, 2024

Date Reported : Nov 29, 2024

Report Number : 3170299-1

**P/O :**  
**Project Name :**  
**Project Location :**

Page 1 of 4

<b>Sample Number</b>	24122221-1
<b>Sampled Date</b>	Nov 19, 2024 11:15 AM
<b>Sample Description</b>	น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้
<b>Location</b>	ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)
<b>Date Analysis Commenced</b>	Nov 19, 2024
<b>Condition of Sample</b>	Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Metals Testing</b>							
Arsenic	mg/L	0.001	0.005	0.01	≤0.25	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Barium	mg/L	0.001	0.005	0.05	≤1.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Cadmium	mg/L	0.001	0.005	Not Detected	≤0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Chromium	mg/L	0.001	0.005	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Copper	mg/L	0.001	0.005	Not Detected	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Hexavalent Chromium	mg/L	0.005	0.01	Not Detected	≤0.25	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3500-Cr B	Songkhla
Lead	mg/L	0.001	0.005	Not Detected	≤0.2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla

Technical Management

Ananta B

Ananta Boonphet  
Scientist (2)

ทะเบียนเลขที่ ว-267-จ-0004

Approved by

Kanitta H.

Kanitta Hemprasatporn  
Section Head

ทะเบียนเลขที่ ว-267-ค-0001

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## Analysis / Test Report

TESTING  
No.0166

**Client :** WMS Depot Co., Ltd.  
31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**Lot ID: 24122221**

Date Received : Nov 19, 2024

Date Reported : Nov 29, 2024

Report Number : 3170299-1

**P/O :**  
**Project Name :**  
**Project Location :**

Page 2 of 4

**Sample Number** 24122221-1  
**Sampled Date** Nov 19, 2024 11:15 AM  
**Sample Description** น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้  
**Location** ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)  
**Date Analysis Commenced** Nov 19, 2024  
**Condition of Sample** Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Metals Testing</b>							
Manganese	mg/L	0.001	0.005	1.73	≤5.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Mercury	mg/L	0.0003	0.0005	Not Detected	≤0.005	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Nickel	mg/L	0.001	0.005	<0.005	≤1.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Selenium	mg/L	0.001	0.005	Not Detected	≤0.02	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Trivalent Chromium *	mg/L	-	0.01	<0.01	≤0.75	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Zinc	mg/L	0.001	0.005	<0.005	≤5.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
<b>Water Testing</b>							
BOD (5 days at 20 degree C)	mg/L	-	2.0	12.3	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Songkhla

Technical Management

Ananta B

Ananta Boonphet  
Scientist (2)

ทะเบียนเลขที่ ว-267-จ-0004

Approved by

Kanitta H.

Kanitta Hemprasatporn  
Section Head

ทะเบียนเลขที่ ว-267-ค-0001

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## Analysis / Test Report

TESTING  
No.0166

Client : WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

P/O :

Project Name :

Project Location :

Lot ID: 24122221

Date Received : Nov 19, 2024

Date Reported : Nov 29, 2024

Report Number : 3170299-1

Page 3 of 4

Sample Number	24122221-1
Sampled Date	Nov 19, 2024 11:15 AM
Sample Description	น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้
Location	ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)
Date Analysis Commenced	Nov 19, 2024
Condition of Sample	Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
COD	mg/L	-	25	77	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Songkhla
Color (at Original pH) *	ADMI	-	5	20	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Songkhla
Color (at pH 7.0) *	ADMI	-	5	18	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Songkhla
Formaldehyde *	mg/L	-	0.1	<0.1	≤1	Wastewater analysis manual, Environmental Engineering Association of Thailand, 4th ed., 2004	Songkhla
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Songkhla
pH at 25 degree C		-	-	7.4	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Songkhla
Phenol	mg/L	0.004	0.01	0.05	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5530 D	Songkhla
Residual Free Chlorine	mg/L	-	0.1	<0.1	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Songkhla
Sulfide *	mg/L	-	0.5	0.8	≤1.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-S2 (C, F)	Songkhla

Technical Management

Ananta B

Ananta Boonphet  
Scientist (2)

ทะเบียนเลขที่ ว-267-จ-0004

Approved by

Kanitta H.

Kanitta Hemprasatporn  
Section Head

ทะเบียนเลขที่ ว-267-ค-0001

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## Analysis / Test Report

TESTING  
No.0166

Client : WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

P/O :

Project Name :

Project Location :

Lot ID: 24122221

Date Received : Nov 19, 2024

Date Reported : Nov 29, 2024

Report Number : 3170299-1

Page 4 of 4

Sample Number	24122221-1						
Sampled Date	Nov 19, 2024 11:15 AM						
Sample Description	น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้						
Location	ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)						
Date Analysis Commenced	Nov 19, 2024						
Condition of Sample	Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
Temperature *	Degree C	-	-	29.8	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Songkhla
Total Dissolved solids Dried at 180 degree C	mg/L	-	5	2520	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Songkhla
Total Suspended Solids	mg/L	-	5	9	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Songkhla

**Guideline** : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

**Sampling By** : Somsak Junkong ทะเบียนเลขที่ ว-267-จ-0011 , Woravut Deenuk ทะเบียนเลขที่ ว-204-จ-0115

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Ananta B.

Ananta Boonphet  
Scientist (2)

ทะเบียนเลขที่ ว-267-จ-0004

Approved by

Kanitta H.

Kanitta Hemprasatporn  
Section Head

ทะเบียนเลขที่ ว-267-ค-0001

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :**

**Project Name :**

**Project Location :**

**TESTING**

**No.0009**

**Lot ID: 24122221**

Date Received : Nov 19, 2024

Date Reported : Nov 29, 2024

Report Number : 3170299-2

Page 1 of 4

<b>Sample Number</b>	24122221-1
<b>Sampled Date</b>	Nov 19, 2024 11:15 AM
<b>Sample Description</b>	น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้
<b>Location</b>	ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)
<b>Date Analysis Commenced</b>	Nov 21, 2024
<b>Condition of Sample</b>	Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Pesticides - Organochlorine Group</b>							
2,4-DDD *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
2,4-DDE *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
2,4-DDT *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
4,4-DDD *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
4,4-DDE *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
4,4-DDT *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Aldrin *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok

**Technical Management**

*Suwimon C.*

Suwimon Chairuangwut

Scientist (3)

ทะเบียนเลขที่ ว-204-จ-0018

**Approved by**

*Kanokkorn Anek*

Kanokkorn Anek

Assistant General Manager

ทะเบียนเลขที่ ว-204-ค-0004

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## Analysis / Test Report

TESTING

No.0009

**Lot ID: 24122221**

Date Received : Nov 19, 2024

Date Reported : Nov 29, 2024

Report Number : 3170299-2

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :**

**Project Name :**

**Project Location :**

Page 2 of 4

<b>Sample Number</b>	24122221-1
<b>Sampled Date</b>	Nov 19, 2024 11:15 AM
<b>Sample Description</b>	น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้
<b>Location</b>	ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)
<b>Date Analysis Commenced</b>	Nov 21, 2024
<b>Condition of Sample</b>	Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Pesticides - Organochlorine Group</b>							
alpha-BHC *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
beta-BHC *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Chlordane *	ug/L	0.02	0.04	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
delta-BHC *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Dieldrin *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Endosulfan *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Endosulfan I *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok

Technical Management

*Suwimon C.*

Suwimon Chairuangwut

Scientist (3)

ทะเบียนเลขที่ ว-204-จ-0018

Approved by

*Kanokkorn Anek*

Kanokkorn Anek

Assistant General Manager

ทะเบียนเลขที่ ว-204-ค-0004

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :**

**Project Name :**

**Project Location :**

**TESTING**

**No.0009**

**Lot ID: 24122221**

Date Received : Nov 19, 2024

Date Reported : Nov 29, 2024

Report Number : 3170299-2

Page 3 of 4

<b>Sample Number</b>	24122221-1
<b>Sampled Date</b>	Nov 19, 2024 11:15 AM
<b>Sample Description</b>	น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้
<b>Location</b>	ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)
<b>Date Analysis Commenced</b>	Nov 21, 2024
<b>Condition of Sample</b>	Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Pesticides - Organochlorine Group</b>							
Endosulfan II *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Endrin *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Endrin aldehyde *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
gamma-BHC (Lindane) *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Heptachlor *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Heptachlor-Epoxide *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Methoxychlor *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok

### Water Testing

**Technical Management**

*Suwimon C.*

Suwimon Chairuangwut  
Scientist (3)  
ทะเบียนเลขที่ ว-204-จ-0018

**Approved by**

*Kanokkorn Anek*

Kanokkorn Anek  
Assistant General Manager  
ทะเบียนเลขที่ ว-204-ค-0004

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :**

**Project Name :**

**Project Location :**

**TESTING**

**No.0009**

**Lot ID: 24122221**

Date Received : Nov 19, 2024

Date Reported : Nov 29, 2024

Report Number : 3170299-2

Page 4 of 4

<b>Sample Number</b>	24122221-1
<b>Sampled Date</b>	Nov 19, 2024 11:15 AM
<b>Sample Description</b>	น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้
<b>Location</b>	ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)
<b>Date Analysis Commenced</b>	Nov 21, 2024
<b>Condition of Sample</b>	Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
Cyanide as CN	mg/L	0.002	0.005	Not Detected	≤0.2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - CN (C, E)	Bangkok
Total Kjeldahl Nitrogen as N *	mg/L	0.15	1.0	11.3	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Norg (C)	Bangkok

**Guideline :** Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

**Sampling By :** Somsak Junkong ทะเบียนเลขที่ ว-267-จ-0011 , Woravut Deenuk ทะเบียนเลขที่ ว-204-จ-0115

**Remark :**

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

**Technical Management**

*Suwimon C.*

Suwimon Chairuangwut

Scientist (3)

ทะเบียนเลขที่ ว-204-จ-0018

**Approved by**

*Kanokkorn Anek*

Kanokkorn Anek

Assistant General Manager

ทะเบียนเลขที่ ว-204-ค-0004

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## Analysis / Test Report

TESTING  
No.0166

Client : WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

P/O :

Project Name :

Project Location :

Lot ID: 24122221

Date Received : Nov 19, 2024

Date Reported : Nov 29, 2024

Report Number : 3170299-3

Page 1 of 1

Sample Number	24122221-1						
Sampled Date	Nov 19, 2024 11:15 AM						
Sample Description	น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้						
Location	ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)						
Date Analysis Commenced	Nov 20, 2024						
Condition of Sample	Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Metals Testing</b>							
Iron	mg/L	0.001	0.005	1.08	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Silver	mg/L	0.001	0.005	Not Detected	≤1.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
<b>Pesticides - Organochlorine Group</b>							
Mirex *	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<b>Water Testing</b>							
Anionic Surfactant as MBAS *	mg/L	0.015	0.05	2.15	≤30	Based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5540 B, C	Bangkok
Flow rate *	m3/hr	-	-	0.75	No Standard	Flow meter	Songkhla
Fluoride as F *	mg/L	0.15	0.5	4.7	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-F (D)	Bangkok

**Guideline** : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

**Sampling By** : Somsak Junkong , Woravut Deenuk

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Approved by

Ananta B.

Ananta Boonphet  
Scientist (2)

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## Analysis / Test Report

TESTING  
No.0166

**Client :** WMS Depot Co., Ltd.  
31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110  
**P/O :** POWMS-24080058  
**Project Name :**  
**Project Location :**

**Lot ID: 24122225**  
Date Received : Dec 12, 2024  
Date Reported : Dec 26, 2024  
Report Number : 3203771-1

Page 1 of 4

**Sample Number** 24122225-1  
**Sampled Date** Dec 12, 2024 10:09 AM  
**Sample Description** น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้  
**Location** ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)  
**Date Analysis Commenced** Dec 12, 2024  
**Condition of Sample** Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Metals Testing</b>							
Arsenic	mg/L	0.001	0.005	0.02	≤0.25	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Barium	mg/L	0.001	0.005	0.03	≤1.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Cadmium	mg/L	0.001	0.005	Not Detected	≤0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Chromium	mg/L	0.001	0.005	Not Detected	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Copper	mg/L	0.001	0.005	Not Detected	≤2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Hexavalent Chromium	mg/L	0.005	0.01	Not Detected	≤0.25	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3500-Cr B	Songkhla
Lead	mg/L	0.001	0.005	Not Detected	≤0.2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla

Technical Management

Ananta B

Ananta Boonphet  
Scientist (2)

ทะเบียนเลขที่ ว-267-จ-0004

Approved by

Kanitta H.

Kanitta Hemprasatporn  
Section Head

ทะเบียนเลขที่ ว-267-ค-0001

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## Analysis / Test Report

TESTING  
No.0166

**Client :** WMS Depot Co., Ltd.  
31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110  
**P/O :** POWMS-24080058  
**Project Name :**  
**Project Location :**

**Lot ID: 24122225**  
Date Received : Dec 12, 2024  
Date Reported : Dec 26, 2024  
Report Number : 3203771-1

Page 2 of 4

**Sample Number** 24122225-1  
**Sampled Date** Dec 12, 2024 10:09 AM  
**Sample Description** น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้  
**Location** ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)  
**Date Analysis Commenced** Dec 12, 2024  
**Condition of Sample** Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Metals Testing</b>							
Manganese	mg/L	0.001	0.005	0.69	≤5.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Mercury	mg/L	0.0003	0.0005	Not Detected	≤0.005	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Nickel	mg/L	0.001	0.005	0.007	≤1.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Selenium	mg/L	0.001	0.005	Not Detected	≤0.02	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Trivalent Chromium *	mg/L	-	0.01	<0.01	≤0.75	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Zinc	mg/L	0.001	0.005	<0.005	≤5.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
<b>Water Testing</b>							
BOD (5 days at 20 degree C)	mg/L	-	2.0	7.3	≤500	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5210 B, part 4500 - O G	Songkhla

Technical Management

Ananta B

Ananta Boonphet  
Scientist (2)

ทะเบียนเลขที่ ว-267-จ-0004

Approved by

Kanitta H.

Kanitta Hemprasatporn  
Section Head

ทะเบียนเลขที่ ว-267-ค-0001

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## Analysis / Test Report

TESTING  
No.0166

**Client :** WMS Depot Co., Ltd.  
31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110  
**P/O :** POWMS-24080058  
**Project Name :**  
**Project Location :**

**Lot ID: 24122225**  
Date Received : Dec 12, 2024  
Date Reported : Dec 26, 2024  
Report Number : 3203771-1

Page 3 of 4

**Sample Number** 24122225-1  
**Sampled Date** Dec 12, 2024 10:09 AM  
**Sample Description** น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้  
**Location** ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)  
**Date Analysis Commenced** Dec 12, 2024  
**Condition of Sample** Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
COD	mg/L	-	25	55	≤750	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5220 D	Songkhla
Color (at Original pH) *	ADMI	-	5	18	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Songkhla
Color (at pH 7.0) *	ADMI	-	5	14	≤600	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2120 F	Songkhla
Formaldehyde *	mg/L	-	0.1	<0.1	≤1	Wastewater analysis manual, Environmental Engineering Association of Thailand, 4th ed., 2004	Songkhla
Oil & Grease	mg/L	-	3	<3	≤10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5520 B	Songkhla
pH at 25 degree C		-	-	7.7	5.5-9.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Songkhla
Phenol	mg/L	0.004	0.01	Not Detected	≤1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5530 D	Songkhla
Residual Free Chlorine	mg/L	-	0.1	<0.1	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Cl (F)	Songkhla
Temperature *	Degree C	-	-	27.3	≤45	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2550 B	Songkhla

Technical Management

Ananta B

Ananta Boonphet  
Scientist (2)

ทะเบียนเลขที่ ว-267-จ-0004

Approved by

Kanitta H.

Kanitta Hemprasatporn  
Section Head

ทะเบียนเลขที่ ว-267-ค-0001

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## Analysis / Test Report

TESTING  
No.0166

Client : WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

P/O : POWMS-24080058

Project Name :

Project Location :

Lot ID: 24122225

Date Received : Dec 12, 2024

Date Reported : Dec 26, 2024

Report Number : 3203771-1

Page 4 of 4

Sample Number	24122225-1
Sampled Date	Dec 12, 2024 10:09 AM
Sample Description	น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้
Location	ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)
Date Analysis Commenced	Dec 12, 2024
Condition of Sample	Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
Total Dissolved solids Dried at 180 degree C	mg/L	-	5	2500	≤3000	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Songkhla
Total Suspended Solids	mg/L	-	5	8	≤200	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 D	Songkhla

**Guideline** : Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

**Note** : This Analysis test report is reissued to supersede report No.3191862-1, Date Reported : Dec 23, 2024 due to revise analytical information.

**Sampling By** : Somsak Junkong ทะเบียนเลขที่ ว-267-จ-0011 , Narathorn Keawpongsa ทะเบียนเลขที่ ว-204-จ-0193

Remark :

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- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

Technical Management

Ananta B.

Ananta Boonphet  
Scientist (2)

ทะเบียนเลขที่ ว-267-จ-0004

Approved by

Kanitta H.

Kanitta Hemprasatporn  
Section Head

ทะเบียนเลขที่ ว-267-ค-0001

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24122225**

Date Received : Dec 12, 2024

Date Reported : Dec 26, 2024

Report Number : 3203771-2

Page 1 of 4

<b>Sample Number</b>	24122225-1
<b>Sampled Date</b>	Dec 12, 2024 10:09 AM
<b>Sample Description</b>	น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้
<b>Location</b>	ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)
<b>Date Analysis Commenced</b>	Dec 14, 2024
<b>Condition of Sample</b>	Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Pesticides - Organochlorine Group</b>							
2,4-DDD	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
2,4-DDE	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
2,4-DDT	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
4,4-DDD	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
4,4-DDE	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
4,4-DDT	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Aldrin	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok

**Technical Management**

*Siriluk P.*

Siriluk Bunnak  
Section Head

ทะเบียนเลขที่ ว-204-จ-0013

**Approved by**

*Kanokkorn Anek*

Kanokkorn Anek  
Assistant General Manager

ทะเบียนเลขที่ ว-204-ค-0004

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24122225**

Date Received : Dec 12, 2024

Date Reported : Dec 26, 2024

Report Number : 3203771-2

Page 2 of 4

<b>Sample Number</b>	24122225-1
<b>Sampled Date</b>	Dec 12, 2024 10:09 AM
<b>Sample Description</b>	น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้
<b>Location</b>	ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)
<b>Date Analysis Commenced</b>	Dec 14, 2024
<b>Condition of Sample</b>	Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Pesticides - Organochlorine Group</b>							
alpha-BHC	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
beta-BHC	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Chlordane	ug/L	0.02	0.04	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
delta-BHC	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Dieldrin	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Endosulfan	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Endosulfan I	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok

**Technical Management**

Siriluk P.

Siriluk Bunnak  
Section Head

ทะเบียนเลขที่ ว-204-จ-0013

**Approved by**

Kanokkorn Anek

Kanokkorn Anek  
Assistant General Manager  
ทะเบียนเลขที่ ว-204-ค-0004

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24122225**

Date Received : Dec 12, 2024

Date Reported : Dec 26, 2024

Report Number : 3203771-2

Page 3 of 4

<b>Sample Number</b>	24122225-1
<b>Sampled Date</b>	Dec 12, 2024 10:09 AM
<b>Sample Description</b>	น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้
<b>Location</b>	ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)
<b>Date Analysis Commenced</b>	Dec 14, 2024
<b>Condition of Sample</b>	Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Pesticides - Organochlorine Group</b>							
Endosulfan II	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Endrin	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Endrin aldehyde	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
gamma-BHC (Lindane)	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Heptachlor	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Heptachlor-Epoxide	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
Methoxychlor	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok

### Water Testing

**Technical Management**

*Siriluk P.*

Siriluk Bunnak  
Section Head

ทะเบียนเลขที่ ว-204-จ-0013

**Approved by**

*Kanokkorn Anek*

Kanokkorn Anek  
Assistant General Manager

ทะเบียนเลขที่ ว-204-ค-0004

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24122225**

Date Received : Dec 12, 2024

Date Reported : Dec 26, 2024

Report Number : 3203771-2

Page 4 of 4

<b>Sample Number</b>	24122225-1
<b>Sampled Date</b>	Dec 12, 2024 10:09 AM
<b>Sample Description</b>	น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้
<b>Location</b>	ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)
<b>Date Analysis Commenced</b>	Dec 14, 2024
<b>Condition of Sample</b>	Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
Cyanide as CN	mg/L	0.002	0.005	Not Detected	≤0.2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - CN (C, E)	Bangkok
Total Kjeldahl Nitrogen as N	mg/L	0.15	1.0	9.9	≤100	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-Norg (C)	Bangkok

**Guideline :** Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

**Note :** This Analysis test report is reissued to supersede report No.3191862-2, Date Reported : Dec 23, 2024 due to revise analytical information.

**Sampling By :** Somsak Junkong ทะเบียนเลขที่ ว-267-จ-0011 , Narathorn Keawpongsa ทะเบียนเลขที่ ว-204-จ-0193

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Technical Management

Siriluk P.

Siriluk Bunnak  
Section Head

ทะเบียนเลขที่ ว-204-จ-0013

Approved by

Kanok Korn Anek

Kanokkorn Anek  
Assistant General Manager  
ทะเบียนเลขที่ ว-204-ค-0004

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24122225**

Date Received : Dec 12, 2024

Date Reported : Dec 26, 2024

Report Number : 3203771-3

Page 1 of 1

<b>Sample Number</b>	24122225-1						
<b>Sampled Date</b>	Dec 12, 2024 10:09 AM						
<b>Sample Description</b>	น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้						
<b>Location</b>	ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)						
<b>Date Analysis Commenced</b>	Dec 13, 2024						
<b>Condition of Sample</b>	Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Metals Testing</b>							
Iron	mg/L	0.001	0.005	0.03	≤10.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
Silver	mg/L	0.001	0.005	Not Detected	≤1.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Songkhla
<b>Pesticides - Organochlorine Group</b>							
Mirex	ug/L	0.01	0.02	Not Detected	Not Detected	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6630 D, part 6410 B	Bangkok
<b>Water Testing</b>							
Anionic Surfactant as MBAS	mg/L	0.015	0.05	3.43	≤30	Based on Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 5540 B, C	Bangkok
Flow rate	m3/hr	-	-	0.62	No Standard	Flow meter	Songkhla
Fluoride as F	mg/L	0.15	0.5	4.6	≤5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-F (D)	Bangkok

**Guideline :** Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

**Note :** This Analysis test report is reissued to supersede report No.3191862-1, Date Reported : Dec 23, 2024 due to revise analytical information.

**Sampling By :** Somsak Junkong , Narathorn Keawpongsa

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

Ananta B.

Ananta Boonphet  
Scientist (2)

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24122225**

Date Received : Dec 12, 2024

Date Reported : Dec 26, 2024

Report Number : 3203771-4

Page 1 of 1

<b>Sample Number</b>	24122225-1
<b>Sampled Date</b>	Dec 12, 2024 10:09 AM
<b>Sample Description</b>	น้ำหลังการบำบัดก่อนระบายไปยังระบบบำบัดน้ำเสียส่วนกลางของนิคมฯภาคใต้
<b>Location</b>	ถังพักน้ำเสียที่ผ่านการบำบัดแล้วขนาด 25 ลูกบาศก์เมตร (WT1)
<b>Date Analysis Commenced</b>	Dec 13, 2024
<b>Condition of Sample</b>	Contained in three amber glass bottles and eleven plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
Sulfide	mg/L	-	0.5	2.8	≤1.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500-S2 (C, F)	Songkhla

**Guideline :** Notification of the Industrial Estate Authority of Thailand No.029/2567 : General Standards for Wastewater drainage into central wastewater treatment systems in Industrial Estates.

**Note :** This Analysis test report is reissued to supersede report No.3191862-1, Date Reported : Dec 23, 2024 due to revise analytical information.

**Sampling By :** Somsak Junkong ทะเบียนเลขที่ ว-267-จ-0011 , Narathorn Keawpongsa ทะเบียนเลขที่ ว-204-จ-0193

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Technical Management

Ananta B.

Ananta Boonphet  
Scientist (2)

ทะเบียนเลขที่ ว-267-จ-0004

Approved by

Kanitta H.

Kanitta Hemprasatporn  
Section Head  
ทะเบียนเลขที่ ว-267-ค-0001

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## Analysis / Test Report

TESTING

No.0009

**Lot ID: 24107921**

Date Received : Oct 02, 2024

Date Reported : Oct 21, 2024

Report Number : 3142489-1

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :** POWMS-24010036

**Project Name :**

**Project Location :**

Page 1 of 5

<b>Sample Number</b>	24107921-1
<b>Sampled Date</b>	Oct 01, 2024 2:17 PM
<b>Sample Description</b>	Ground Water
<b>Location</b>	Monitoring Well MW-2
<b>Date Analysis Commenced</b>	Oct 03, 2024
<b>Condition of Sample</b>	Contained in two vials, two glass vials and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Metals Testing</b>							
Arsenic	mg/L	0.0003	0.0005	0.0010	0.1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Cadmium	mg/L	0.0003	0.0005	Not Detected	2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Chromium	mg/L	0.0003	0.0005	Not Detected	6.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Lead	mg/L	0.0003	0.0005	Not Detected	4.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Mercury *	mg/L	0.0001	0.0005	0.003	0.7	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3112	Bangkok
Nickel	mg/L	0.0003	0.0005	0.0010	5.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Zinc	mg/L	0.003	0.005	0.01	10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok

### Volatile Organics Compounds

**Technical Management**

*Savitree N.*

Savitree Noisangiam  
Manager

ทะเบียนเลขที่ ว-204-จ-0007

**Approved by**

*Kanokkorn Anek*

Kanokkorn Anek  
Assistant General Manager

ทะเบียนเลขที่ ว-204-ค-0004

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## Analysis / Test Report

TESTING

No.0009

**Lot ID: 24107921**

Date Received : Oct 02, 2024

Date Reported : Oct 21, 2024

Report Number : 3142489-1

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :** POWMS-24010036

**Project Name :**

**Project Location :**

Page 2 of 5

<b>Sample Number</b>	24107921-1
<b>Sampled Date</b>	Oct 01, 2024 2:17 PM
<b>Sample Description</b>	Ground Water
<b>Location</b>	Monitoring Well MW-2
<b>Date Analysis Commenced</b>	Oct 03, 2024
<b>Condition of Sample</b>	Contained in two vials, two glass vials and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Volatile Organics Compounds</b>							
1,1,1-Trichloroethane	mg/L	0.00008	0.0005	Not Detected	0.2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,1,2,2-Tetrachloroethane *	mg/L	0.0003	0.001	Not Detected	0.2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,1,2-Trichloroethane	mg/L	0.00008	0.0005	Not Detected	0.8	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,1-Dichloroethane *	mg/L	0.00015	0.0005	Not Detected	24	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,1-Dichloroethylene *	mg/L	0.00011	0.0005	Not Detected	0.1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,2-Dichloroethane	mg/L	0.00007	0.0005	Not Detected	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,2-Dichloropropane *	mg/L	0.0003	0.001	Not Detected	0.7	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,3,5-Trimethylbenzene *	mg/L	0.0003	0.001	Not Detected	12	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,3-Dichloropropane *	mg/L	0.00015	0.0005	Not Detected	72	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok

Technical Management

*Savitree N.*

Savitree Noisangiam  
Manager

ทะเบียนเลขที่ ว-204-จ-0007

Approved by

*Kanok Korn Anek*

Kanokkorn Anek  
Assistant General Manager  
ทะเบียนเลขที่ ว-204-ค-0004

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## Analysis / Test Report

TESTING

No.0009

**Lot ID: 24107921**

Date Received : Oct 02, 2024

Date Reported : Oct 21, 2024

Report Number : 3142489-1

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :** POWMS-24010036

**Project Name :**

**Project Location :**

Page 3 of 5

<b>Sample Number</b>	24107921-1
<b>Sampled Date</b>	Oct 01, 2024 2:17 PM
<b>Sample Description</b>	Ground Water
<b>Location</b>	Monitoring Well MW-2
<b>Date Analysis Commenced</b>	Oct 03, 2024
<b>Condition of Sample</b>	Contained in two vials, two glass vials and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Volatile Organics Compounds</b>							
1,3-Dichloropropene *	mg/L	0.0003	0.001	Not Detected	0.3	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Acetone *	mg/L	0.001	0.01	Not Detected	230	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Benzene	mg/L	0.00003	0.0005	Not Detected	0.2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Bromodichloromethane *	mg/L	0.0003	0.001	Not Detected	0.8	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Bromoform *	mg/L	0.00015	0.0005	Not Detected	6.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Carbon disulfide *	mg/L	0.0002	0.005	<0.005	4.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Carbon tetrachloride	mg/L	0.00008	0.0005	Not Detected	0.4	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Chlorobenzene *	mg/L	0.0005	0.001	Not Detected	48	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Chlorodibromomethane *	mg/L	0.0003	0.001	Not Detected	0.6	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok

**Technical Management**

*Savitree N.*

Savitree Noisangiam  
Manager

ทะเบียนเลขที่ ว-204-จ-0007

**Approved by**

*Kanok Korn Anek*

Kanokkorn Anek  
Assistant General Manager  
ทะเบียนเลขที่ ว-204-ค-0004

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Report Number : 3142489-1

**Client :** WMS Depot Co., Ltd.

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**P/O :** POWMS-24010036

**Project Name :**

**Project Location :**

Page 4 of 5

<b>Sample Number</b>	24107921-1
<b>Sampled Date</b>	Oct 01, 2024 2:17 PM
<b>Sample Description</b>	Ground Water
<b>Location</b>	Monitoring Well MW-2
<b>Date Analysis Commenced</b>	Oct 03, 2024
<b>Condition of Sample</b>	Contained in two vials, two glass vials and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Volatile Organics Compounds</b>							
Chloroform *	mg/L	0.00015	0.0005	Not Detected	8.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
cis-1,2-Dichloroethylene	mg/L	0.00004	0.0005	Not Detected	2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Hexachloro-1,3-Butadiene *	mg/L	0.0003	0.001	Not Detected	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Methyl Bromide *	mg/L	0.00003	0.005	Not Detected	3.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Methyl tert butyl ether *	mg/L	0.00015	0.001	Not Detected	24	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Methylene Chloride (Dichloromethane)	mg/L	0.0001	0.0005	Not Detected	6.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
o-Xylene	mg/L	0.00004	0.0005	Not Detected	24	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Styrene	mg/L	0.00002	0.0005	Not Detected	24	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Tetrachloroethylene	mg/L	0.00007	0.0005	Not Detected	0.9	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok

**Technical Management**

*Savitree N.*

Savitree Noisangiam  
Manager

ทะเบียนเลขที่ ว-204-จ-0007

**Approved by**

*Kanokkorn Anek*

Kanokkorn Anek  
Assistant General Manager  
ทะเบียนเลขที่ ว-204-ค-0004

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## Analysis / Test Report

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Date Received : Oct 02, 2024

Date Reported : Oct 21, 2024

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**Client :** WMS Depot Co., Ltd.

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**P/O :** POWMS-24010036

**Project Name :**

**Project Location :**

Page 5 of 5

<b>Sample Number</b>	24107921-1						
<b>Sampled Date</b>	Oct 01, 2024 2:17 PM						
<b>Sample Description</b>	Ground Water						
<b>Location</b>	Monitoring Well MW-2						
<b>Date Analysis Commenced</b>	Oct 03, 2024						
<b>Condition of Sample</b>	Contained in two vials, two glass vials and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Volatile Organics Compounds</b>							
trans-1,2-Dichloroethylene	mg/L	0.0001	0.0005	Not Detected	5.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Trichloroethylene	mg/L	0.00005	0.0005	Not Detected	4.4	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Vinyl Acetate *	mg/L	0.0015	0.005	Not Detected	119	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	Not Detected	0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
<b>Water Testing</b>							
pH at 25 degree C		-	-	6.2	6.5-9.2 (I)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Bangkok

**Guideline :** Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

(I): ในกรณีที่มีการปนเปื้อนของกรดหรือด่างให้เปรียบเทียบผลวิเคราะห์ค่าพีเอชจากจุดเก็บตัวอย่างบ่อน้ำที่ใช้ในการติดตามตรวจสอบการปนเปื้อนกับผลวิเคราะห์จากจุดเก็บตัวอย่างบ่อน้ำที่ใช้เป็นบ่ออ้างอิงบนทิศทางการไหลของน้ำใต้ดินในพื้นที่ โดยค่าพีเอชที่เปลี่ยนแปลงจะต้องไม่เกินหนึ่งระดับ และไม่อยู่นอกช่วงค่าเกณฑ์อนุโลมสูงสุดของมาตรฐานคุณภาพน้ำบาดาลที่ใช้บริเวณคือ 6.5-9.2

**Note :** This Analysis test report is reissued to supersede report No.3133534-1, Date Reported : Oct 09, 2024 due to revise analytical information.

**Sampling By :** Somsak Junkong ทะเบียนเลขที่ ว-267-จ-0011

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

**Technical Management**

*Savitree N.*

Savitree Noisangiam

Manager

ทะเบียนเลขที่ ว-204-จ-0007

**Approved by**

*Kanokkorn Anek*

Kanokkorn Anek

Assistant General Manager

ทะเบียนเลขที่ ว-204-ค-0004

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## Analysis / Test Report

Client : WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

P/O : POWMS-24010036

Project Name :

Project Location :

TESTING

No.0009

Lot ID: 24107921

Date Received : Oct 02, 2024

Date Reported : Oct 21, 2024

Report Number : 3142491-1

Page 1 of 5

Sample Number	24107921-3
Sampled Date	Oct 01, 2024 2:05 PM
Sample Description	Ground Water
Location	Monitoring Well MW-5
Date Analysis Commenced	Oct 03, 2024
Condition of Sample	Contained in two vials, two glass vials and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Metals Testing</b>							
Arsenic	mg/L	0.0003	0.0005	0.003	0.1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Cadmium	mg/L	0.0003	0.0005	Not Detected	2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Chromium	mg/L	0.0003	0.0005	0.005	6.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Lead	mg/L	0.0003	0.0005	0.008	4.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Mercury *	mg/L	0.0001	0.0005	<0.0005	0.7	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3112	Bangkok
Nickel	mg/L	0.0003	0.0005	0.008	5.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Zinc	mg/L	0.003	0.005	0.07	10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok

### Volatile Organics Compounds

Technical Management

*Savitree N.*

Savitree Noisangiam  
Manager

ทะเบียนเลขที่ ว-204-จ-0007

Approved by

*Kanokkorn Anek*

Kanokkorn Anek  
Assistant General Manager

ทะเบียนเลขที่ ว-204-ค-0004

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## Analysis / Test Report

TESTING

No.0009

**Lot ID: 24107921**

Date Received : Oct 02, 2024

Date Reported : Oct 21, 2024

Report Number : 3142491-1

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :** POWMS-24010036

**Project Name :**

**Project Location :**

Page 2 of 5

<b>Sample Number</b>	24107921-3
<b>Sampled Date</b>	Oct 01, 2024 2:05 PM
<b>Sample Description</b>	Ground Water
<b>Location</b>	Monitoring Well MW-5
<b>Date Analysis Commenced</b>	Oct 03, 2024
<b>Condition of Sample</b>	Contained in two vials, two glass vials and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Volatile Organics Compounds</b>							
1,1,1-Trichloroethane	mg/L	0.00008	0.0005	Not Detected	0.2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,1,2,2-Tetrachloroethane *	mg/L	0.0003	0.001	Not Detected	0.2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,1,2-Trichloroethane	mg/L	0.00008	0.0005	Not Detected	0.8	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,1-Dichloroethane *	mg/L	0.00015	0.0005	Not Detected	24	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,1-Dichloroethylene *	mg/L	0.00011	0.0005	Not Detected	0.1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,2-Dichloroethane	mg/L	0.00007	0.0005	Not Detected	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,2-Dichloropropane *	mg/L	0.0003	0.001	Not Detected	0.7	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,3,5-Trimethylbenzene *	mg/L	0.0003	0.001	Not Detected	12	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,3-Dichloropropane *	mg/L	0.00015	0.0005	Not Detected	72	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok

**Technical Management**

*Savitree N.*

Savitree Noisangiam  
Manager

ทะเบียนเลขที่ ว-204-จ-0007

**Approved by**

*Kanok Korn Anek*

Kanokkorn Anek  
Assistant General Manager  
ทะเบียนเลขที่ ว-204-ค-0004

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**P/O :** POWMS-24010036

**Project Name :**

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Page 3 of 5

<b>Sample Number</b>	24107921-3
<b>Sampled Date</b>	Oct 01, 2024 2:05 PM
<b>Sample Description</b>	Ground Water
<b>Location</b>	Monitoring Well MW-5
<b>Date Analysis Commenced</b>	Oct 03, 2024
<b>Condition of Sample</b>	Contained in two vials, two glass vials and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Volatile Organics Compounds</b>							
1,3-Dichloropropene *	mg/L	0.0003	0.001	Not Detected	0.3	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Acetone *	mg/L	0.001	0.01	Not Detected	230	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Benzene	mg/L	0.00003	0.0005	Not Detected	0.2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Bromodichloromethane *	mg/L	0.0003	0.001	Not Detected	0.8	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Bromoform *	mg/L	0.00015	0.0005	Not Detected	6.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Carbon disulfide *	mg/L	0.0002	0.005	<0.005	4.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Carbon tetrachloride	mg/L	0.00008	0.0005	Not Detected	0.4	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Chlorobenzene *	mg/L	0.0005	0.001	Not Detected	48	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Chlorodibromomethane *	mg/L	0.0003	0.001	Not Detected	0.6	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok

**Technical Management**

*Savitree N.*

Savitree Noisangiam  
Manager

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**Approved by**

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Assistant General Manager  
ทะเบียนเลขที่ ว-204-ค-0004

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## Analysis / Test Report

TESTING

No.0009

**Lot ID: 24107921**

Date Received : Oct 02, 2024

Date Reported : Oct 21, 2024

Report Number : 3142491-1

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :** POWMS-24010036

**Project Name :**

**Project Location :**

Page 4 of 5

<b>Sample Number</b>	24107921-3
<b>Sampled Date</b>	Oct 01, 2024 2:05 PM
<b>Sample Description</b>	Ground Water
<b>Location</b>	Monitoring Well MW-5
<b>Date Analysis Commenced</b>	Oct 03, 2024
<b>Condition of Sample</b>	Contained in two vials, two glass vials and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Volatile Organics Compounds</b>							
Chloroform *	mg/L	0.00015	0.0005	Not Detected	8.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
cis-1,2-Dichloroethylene	mg/L	0.00004	0.0005	Not Detected	2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Hexachloro-1,3-Butadiene *	mg/L	0.0003	0.001	Not Detected	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Methyl Bromide *	mg/L	0.00003	0.005	Not Detected	3.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Methyl tert butyl ether *	mg/L	0.00015	0.001	Not Detected	24	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Methylene Chloride (Dichloromethane)	mg/L	0.0001	0.0005	Not Detected	6.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
o-Xylene	mg/L	0.00004	0.0005	Not Detected	24	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Styrene	mg/L	0.00002	0.0005	Not Detected	24	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Tetrachloroethylene	mg/L	0.00007	0.0005	Not Detected	0.9	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok

**Technical Management**

*Savitree N.*

Savitree Noisangiam  
Manager

ทะเบียนเลขที่ ว-204-จ-0007

**Approved by**

*Kanokkorn Anek*

Kanokkorn Anek  
Assistant General Manager  
ทะเบียนเลขที่ ว-204-ค-0004

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## Analysis / Test Report

TESTING

No.0009

**Lot ID: 24107921**

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Date Reported : Oct 21, 2024

Report Number : 3142491-1

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :** POWMS-24010036

**Project Name :**

**Project Location :**

Page 5 of 5

<b>Sample Number</b>	24107921-3						
<b>Sampled Date</b>	Oct 01, 2024 2:05 PM						
<b>Sample Description</b>	Ground Water						
<b>Location</b>	Monitoring Well MW-5						
<b>Date Analysis Commenced</b>	Oct 03, 2024						
<b>Condition of Sample</b>	Contained in two vials, two glass vials and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						
Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Volatile Organics Compounds</b>							
trans-1,2-Dichloroethylene	mg/L	0.0001	0.0005	Not Detected	5.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Trichloroethylene	mg/L	0.00005	0.0005	Not Detected	4.4	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Vinyl Acetate *	mg/L	0.0015	0.005	Not Detected	119	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	Not Detected	0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
<b>Water Testing</b>							
pH at 25 degree C		-	-	6.5	6.5-9.2 (I)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Bangkok

**Guideline :** Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

(I): ในกรณีที่มีการปนเปื้อนของกรดหรือด่างให้เปรียบเทียบผลวิเคราะห์ค่าพีเอชจากจุดเก็บตัวอย่างบ่อน้ำที่ใช้ในการติดตามตรวจสอบการปนเปื้อนกับผลวิเคราะห์จากจุดเก็บตัวอย่างบ่อน้ำที่ใช้เป็นบ่ออ้างอิงบนทิศทางการไหลของน้ำใต้ดินในพื้นที่ โดยค่าพีเอชที่เปลี่ยนแปลงจะต้องไม่เกินหนึ่งระดับ และไม่อยู่นอกช่วงค่าเกณฑ์อนุโลมสูงสุดของมาตรฐานคุณภาพน้ำบาดาลที่ใช้บริเวณคือ 6.5-9.2

**Note :** This Analysis test report is reissued to supersede report No.3133536-1, Date Reported : Oct 09, 2024 due to revise analytical information.

**Sampling By :** Somsak Junkong ทะเบียนเลขที่ ว-267-จ-0011

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

**Technical Management**

*Savitree N.*

Savitree Noisangiam  
Manager

ทะเบียนเลขที่ ว-204-จ-0007

**Approved by**

*Kanokkorn Anek*

Kanokkorn Anek  
Assistant General Manager  
ทะเบียนเลขที่ ว-204-ค-0004

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## Analysis / Test Report

TESTING

No.0009

**Lot ID: 24107921**

Date Received : Oct 02, 2024

Date Reported : Oct 21, 2024

Report Number : 3142492-1

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :** POWMS-24010036

**Project Name :**

**Project Location :**

Page 1 of 5

<b>Sample Number</b>	24107921-4
<b>Sampled Date</b>	Oct 01, 2024 1:50 PM
<b>Sample Description</b>	Ground Water
<b>Location</b>	Monitoring Well MW-6
<b>Date Analysis Commenced</b>	Oct 03, 2024
<b>Condition of Sample</b>	Contained in two vials, two glass vials and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Metals Testing</b>							
Arsenic	mg/L	0.0003	0.0005	0.002	0.1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Cadmium	mg/L	0.0003	0.0005	Not Detected	2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Chromium	mg/L	0.0003	0.0005	0.001	6.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Lead	mg/L	0.0003	0.0005	0.010	4.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Mercury *	mg/L	0.0001	0.0005	Not Detected	0.7	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3112	Bangkok
Nickel	mg/L	0.0003	0.0005	0.004	5.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Zinc	mg/L	0.003	0.005	0.04	10	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok

### Volatile Organics Compounds

Technical Management

*Savitree N.*

Savitree Noisangiam  
Manager

ทะเบียนเลขที่ ว-204-จ-0007

Approved by

*Kanokkorn Anek*

Kanokkorn Anek  
Assistant General Manager  
ทะเบียนเลขที่ ว-204-ค-0004

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## Analysis / Test Report

TESTING

No.0009

**Lot ID: 24107921**

Date Received : Oct 02, 2024

Date Reported : Oct 21, 2024

Report Number : 3142492-1

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :** POWMS-24010036

**Project Name :**

**Project Location :**

Page 2 of 5

<b>Sample Number</b>	24107921-4
<b>Sampled Date</b>	Oct 01, 2024 1:50 PM
<b>Sample Description</b>	Ground Water
<b>Location</b>	Monitoring Well MW-6
<b>Date Analysis Commenced</b>	Oct 03, 2024
<b>Condition of Sample</b>	Contained in two vials, two glass vials and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Volatile Organics Compounds</b>							
1,1,1-Trichloroethane	mg/L	0.00008	0.0005	Not Detected	0.2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,1,2,2-Tetrachloroethane *	mg/L	0.0003	0.001	Not Detected	0.2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,1,2-Trichloroethane	mg/L	0.00008	0.0005	Not Detected	0.8	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,1-Dichloroethane *	mg/L	0.00015	0.0005	Not Detected	24	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,1-Dichloroethylene *	mg/L	0.00011	0.0005	Not Detected	0.1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,2-Dichloroethane	mg/L	0.00007	0.0005	Not Detected	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,2-Dichloropropane *	mg/L	0.0003	0.001	Not Detected	0.7	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,3,5-Trimethylbenzene *	mg/L	0.0003	0.001	Not Detected	12	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
1,3-Dichloropropane *	mg/L	0.00015	0.0005	Not Detected	72	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok

Technical Management

*Savitree N.*

Savitree Noisangiam  
Manager

ทะเบียนเลขที่ ว-204-จ-0007

Approved by

*Kanokkorn Anek*

Kanokkorn Anek  
Assistant General Manager  
ทะเบียนเลขที่ ว-204-ค-0004

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<b>Sample Number</b>	24107921-4
<b>Sampled Date</b>	Oct 01, 2024 1:50 PM
<b>Sample Description</b>	Ground Water
<b>Location</b>	Monitoring Well MW-6
<b>Date Analysis Commenced</b>	Oct 03, 2024
<b>Condition of Sample</b>	Contained in two vials, two glass vials and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Volatile Organics Compounds</b>							
1,3-Dichloropropene *	mg/L	0.0003	0.001	Not Detected	0.3	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Acetone *	mg/L	0.001	0.01	0.02	230	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Benzene	mg/L	0.00003	0.0005	Not Detected	0.2	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Bromodichloromethane *	mg/L	0.0003	0.001	Not Detected	0.8	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Bromoform *	mg/L	0.00015	0.0005	Not Detected	6.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Carbon disulfide *	mg/L	0.0002	0.005	0.021	4.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Carbon tetrachloride	mg/L	0.00008	0.0005	Not Detected	0.4	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Chlorobenzene *	mg/L	0.0005	0.001	Not Detected	48	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Chlorodibromomethane *	mg/L	0.0003	0.001	Not Detected	0.6	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok

**Technical Management**

*Savitree N.*

Savitree Noisangiam  
Manager

ทะเบียนเลขที่ ว-204-จ-0007

**Approved by**

*Kanokkorn Anek*

Kanokkorn Anek  
Assistant General Manager  
ทะเบียนเลขที่ ว-204-ค-0004

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<b>Sample Number</b>	24107921-4
<b>Sampled Date</b>	Oct 01, 2024 1:50 PM
<b>Sample Description</b>	Ground Water
<b>Location</b>	Monitoring Well MW-6
<b>Date Analysis Commenced</b>	Oct 03, 2024
<b>Condition of Sample</b>	Contained in two vials, two glass vials and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Volatile Organics Compounds</b>							
Chloroform *	mg/L	0.00015	0.0005	Not Detected	8.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
cis-1,2-Dichloroethylene	mg/L	0.00004	0.0005	Not Detected	2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Hexachloro-1,3-Butadiene *	mg/L	0.0003	0.001	Not Detected	0.5	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Methyl Bromide *	mg/L	0.00003	0.005	Not Detected	3.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Methyl tert butyl ether *	mg/L	0.00015	0.001	Not Detected	24	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Methylene Chloride (Dichloromethane)	mg/L	0.0001	0.0005	0.0160	6.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
o-Xylene	mg/L	0.00004	0.0005	Not Detected	24	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Styrene	mg/L	0.00002	0.0005	0.0024	24	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Tetrachloroethylene	mg/L	0.00007	0.0005	Not Detected	0.9	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok

**Technical Management**

*Savitree N.*

Savitree Noisangiam  
Manager

ทะเบียนเลขที่ ว-204-จ-0007

**Approved by**

*Kanokkorn Anek*

Kanokkorn Anek  
Assistant General Manager  
ทะเบียนเลขที่ ว-204-ค-0004

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Report Number : 3142492-1

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**P/O :** POWMS-24010036

**Project Name :**

**Project Location :**

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<b>Sample Number</b>	24107921-4
<b>Sampled Date</b>	Oct 01, 2024 1:50 PM
<b>Sample Description</b>	Ground Water
<b>Location</b>	Monitoring Well MW-6
<b>Date Analysis Commenced</b>	Oct 03, 2024
<b>Condition of Sample</b>	Contained in two vials, two glass vials and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Volatile Organics Compounds</b>							
trans-1,2-Dichloroethylene	mg/L	0.0001	0.0005	Not Detected	5.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Trichloroethylene	mg/L	0.00005	0.0005	Not Detected	4.4	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Vinyl Acetate *	mg/L	0.0015	0.005	Not Detected	119	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
Vinyl chloride (Chloroethylene)	mg/L	0.00016	0.0003	Not Detected	0.03	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 6200 B	Bangkok
<b>Water Testing</b>							
pH at 25 degree C		-	-	5.4	6.5-9.2 (I)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Bangkok

**Guideline :** Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

(I): ในกรณีที่มีการปนเปื้อนของกรดหรือด่างให้เปรียบเทียบผลวิเคราะห์ค่าพีเอชจากจุดเก็บตัวอย่างบ่อน้ำที่ใช้ในการติดตามตรวจสอบการปนเปื้อนกับผลวิเคราะห์จากจุดเก็บตัวอย่างบ่อน้ำที่ใช้เป็นบ่ออ้างอิงบนทิศทางการไหลของน้ำใต้ดินในพื้นที่ โดยค่าพีเอชที่เปลี่ยนแปลงจะต้องไม่เกินหนึ่งระดับ และไม่อยู่นอกช่วงค่าเกณฑ์อนุโลมสูงสุดของมาตรฐานคุณภาพน้ำบาดาลที่ใช้บริโภคคือ 6.5-9.2

**Note :** This Analysis test report is reissued to supersede report No.3133537-1, Date Reported : Oct 09, 2024 due to revise analytical information.

**Sampling By :** Somsak Junkong ทะเบียนเลขที่ ว-267-จ-0011

Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

**Technical Management**

*Savitree N.*

Savitree Noisangiam  
Manager

ทะเบียนเลขที่ ว-204-จ-0007

**Approved by**

*Kanokkorn Anek*

Kanokkorn Anek  
Assistant General Manager  
ทะเบียนเลขที่ ว-204-ค-0004

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## Analysis / Test Report

TESTING

No.0009

**Lot ID: 24122217**

Date Received : Oct 30, 2024

Date Reported : Jan 17, 2025

Report Number : 3215658-1

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

Page 1 of 1

<b>Sample Number</b>	24122217-1
<b>Sampled Date</b>	Oct 29, 2024 1:55 PM
<b>Sample Description</b>	Ground Water
<b>Location</b>	Monitoring Well MW-7
<b>Date Analysis Commenced</b>	Oct 31, 2024
<b>Condition of Sample</b>	Contained in two glass vials and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Metals Testing</b>							
Arsenic	mg/L	0.0003	0.0005	<0.0005	0.1	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Cadmium	mg/L	0.0003	0.0005	Not Detected	2.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Lead	mg/L	0.0003	0.0005	0.002	4.0	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3125 B,3030 F	Bangkok
Mercury *	mg/L	0.0001	0.0005	<0.0005	0.7	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 3112	Bangkok
<b>Water Testing</b>							
pH at 25 degree C		-	-	6.3	6.5-9.2 (I)	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 4500 - H (B)	Bangkok

**Guideline :** Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

**Note :** This Analysis test report is reissued to supersede report No.3151938-1, Date Reported : Nov 02, 2024 due to revise guideline/specification

**Sampling By :** Somsak Junkong ทะเบียนเลขที่ ว-267-จ-0011

**Remark :**

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)
- Analyte(s) marked \* is/are not included in scope of Accreditation ISO/IEC 17025.
- The laboratory has been accepted as an accredited laboratory complying with the ISO/IEC 17025.

**Technical Management**

Siriluk P.

Siriluk Bunnak  
Section Head

ทะเบียนเลขที่ ว-204-จ-0013

**Approved by**

Kanokkorn Anek

Kanokkorn Anek  
Assistant General Manager  
ทะเบียนเลขที่ ว-204-ค-0004

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24122217**

Date Received : Oct 30, 2024

Date Reported : Jan 17, 2025

Report Number : 3215658-2

Page 1 of 1

<b>Sample Number</b>	24122217-1						
<b>Sampled Date</b>	Oct 29, 2024 1:55 PM						
<b>Sample Description</b>	Ground Water						
<b>Location</b>	Monitoring Well MW-7						
<b>Date Analysis Commenced</b>	Oct 31, 2024						
<b>Condition of Sample</b>	Contained in two glass vials and two plastic bottles, sample containers comply to pretreatment - preservation standards (APHA, USEPA)						

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
Total Dissolved solids Dried at 180 degree C	mg/L	-	5	60	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Bangkok

**Guideline :** Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

**Note :** This Analysis test report is reissued to supersede report No.3151938-1, Date Reported : Nov 02, 2024 due to revise guideline/specification

**Sampling By :** Somsak Junkong

Remark :

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Approved by

Siriluk P.

Siriluk Bunnak  
Section Head

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**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24122217**

Date Received : Oct 30, 2024

Date Reported : Jan 17, 2025

Report Number : 3215659-1

Page 1 of 1

<b>Sample Number</b>	24122217-2
<b>Sampled Date</b>	Oct 29, 2024 1:30 PM
<b>Sample Description</b>	Ground Water
<b>Location</b>	Monitoring Well MW-2
<b>Date Analysis Commenced</b>	Oct 31, 2024
<b>Condition of Sample</b>	Contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
Total Dissolved solids Dried at 180 degree C	mg/L	-	5	72	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Bangkok

**Guideline :** Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

**Note :** This Analysis test report is reissued to supersede report No.3151938-1, Date Reported : Nov 02, 2024 due to revise guideline/specification

**Sampling By :** Somsak Junkong

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Approved by

Siriluk P.

Siriluk Bunnak  
Section Head

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## Analysis / Test Report

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Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24122217**

Date Received : Oct 30, 2024

Date Reported : Jan 17, 2025

Report Number : 3215660-1

Page 1 of 1

<b>Sample Number</b>	24122217-3
<b>Sampled Date</b>	Oct 29, 2024 1:40 PM
<b>Sample Description</b>	Ground Water
<b>Location</b>	Monitoring Well MW-5
<b>Date Analysis Commenced</b>	Oct 31, 2024
<b>Condition of Sample</b>	Contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
Total Dissolved solids Dried at 180 degree C	mg/L	-	5	50	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Bangkok

**Guideline :** Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

**Note :** This Analysis test report is reissued to supersede report No.3151938-1, Date Reported : Nov 02, 2024 due to revise guideline/specification

**Sampling By :** Somsak Junkong

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Approved by

Siriluk P.

Siriluk Bunnak  
Section Head

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

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Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24122217**

Date Received : Oct 30, 2024

Date Reported : Jan 17, 2025

Report Number : 3215661-1

Page 1 of 1

<b>Sample Number</b>	24122217-4
<b>Sampled Date</b>	Oct 29, 2024 1:50 PM
<b>Sample Description</b>	Ground Water
<b>Location</b>	Monitoring Well MW-6
<b>Date Analysis Commenced</b>	Oct 31, 2024
<b>Condition of Sample</b>	Contained in one plastic bottle, sample containers comply to pretreatment - preservation standards (APHA, USEPA)

Analyte	Unit	LOD	LOQ (LOR)	Result	Guideline / Specification	Method	Testing Location
<b>Water Testing</b>							
Total Dissolved solids Dried at 180 degree C	mg/L	-	5	34	No Standard	Standard Methods for the Examination of Water and Wastewater. APHA, AWWA & WEF, 24th ed., 2023, part 2540 C	Bangkok

**Guideline :** Notification of the Ministry of Industry B.E. 2559 (2016) on Soil and Groundwater Contamination Criteria, Monitoring of Soil and Groundwater Quality, Report Submission and Report Preparation of Soil and Groundwater Quality, and Proposal Report of Soil and Groundwater Controlling and Reduction Measures

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**Sampling By :** Somsak Junkong

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Approved by

Siriluk P.

Siriluk Bunnak  
Section Head

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ผลการตรวจวิเคราะห์สภาพแวดล้อม



## Analysis / Test Report

Client : WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

P/O :

Project Name :

Project Location:

**Lot ID: 24142110 (1)**

Date Received : Dec 24, 2024

Date Reported : Dec 26, 2024

Report Number: 24142110 (1)-1

Page 1 of 1

### Waste Management Siam Ltd.

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
1	Area : พื้นที่จัดเก็บภาชนะบรรจุน้ำเสีย (L1)	24142110 (1)-1	23-Dec-24	Day time	1	631	441	100	200	Pass
		24142110 (1)-2	23-Dec-24	Day time	2	367				
		24142110 (1)-3	23-Dec-24	Day time	3	249				
		24142110 (1)-4	23-Dec-24	Day time	4	287				
		24142110 (1)-5	23-Dec-24	Day time	5	486				
		24142110 (1)-6	23-Dec-24	Day time	6	624				

Measurement by : Tana Supapan

Guideline : Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

Supot Salamteh  
Section Head

Approved by

Wichan Choonharat  
Assistant Manager

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :**

**Project Name :**

**Project Location:**

**Lot ID: 24142110 (2)**

Date Received : Dec 24, 2024

Date Reported : Dec 26, 2024

Report Number: 24142110 (2)-1

Page 1 of 1

### Waste Management Siam Ltd.

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
2	Area : พื้นที่จัดเก็บสารเคมี (L2)	24142110 (2)-1	23-Dec-24	Day time	1	206	207	100	200	Pass
		24142110 (2)-2	23-Dec-24	Day time	2	212				
		24142110 (2)-3	23-Dec-24	Day time	3	207				
		24142110 (2)-4	23-Dec-24	Day time	4	201				
		24142110 (2)-5	23-Dec-24	Day time	5	204				
		24142110 (2)-6	23-Dec-24	Day time	6	210				

**Measurement by :** Tana Supapan

**Guideline :** Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

Supot Salamteh  
Section Head

Approved by

Wichan Choonharat  
Assistant Manager

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :**

**Project Name :**

**Project Location:**

**Lot ID: 24142110 (4)**

Date Received : Dec 24, 2024

Date Reported : Dec 26, 2024

Report Number: 24142110 (4)-1

Page 1 of 1

### Waste Management Siam Ltd.

Lay out No.	Location	Reference Number	Date	Time	No.	Illuminance (Lux)		Guideline Limit		Comment
						Spot	Average	Spot/Min	Average	
3	Area : ระบบบำบัดน้ำเสียชั้นที่ 2 (L4)	24142110 (4)-1	23-Dec-24	Day time	1	327	301	150	300	Pass
		24142110 (4)-2	23-Dec-24	Day time	2	268				
		24142110 (4)-3	23-Dec-24	Day time	3	314				
		24142110 (4)-4	23-Dec-24	Day time	4	326				
		24142110 (4)-5	23-Dec-24	Day time	5	342				
		24142110 (4)-6	23-Dec-24	Day time	6	227				

**Measurement by :** Tana Supapan

**Guideline :** Notification of Department of Labour Protection and Welfare, B.E.2560 (2017) dated November 27, B.E.2560 (2017), and published in the Royal Government Gazette, Vol.135, Part 39D dated February 21 B.E.2561 (2018)

Technical Management

Supot Salamteh  
Section Head

Approved by

Wichan Choonharat  
Assistant Manager

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand  
90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24142109**

Date Received : Dec 25, 2024

Date Reported : Dec 27, 2024

Report Number: 3205060-1

Page 1 of 1

**Sample Number** 24142109-2  
**Parameter** Noise (Leq 8 hrs.)  
**Location** ระบบบำบัดน้ำเสียขั้นที่ 2 (N2)  
**Measurement Date** Dec 23, 2024  
**Measurement by** Tana Supapan

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:02 AM - 10:02 AM	73.9	86.6	53.5
10:02 AM - 11:02 AM	74.5	83.2	52.8
11:02 AM - 12:02 PM	74.7	80.9	61.5
12:02 PM - 01:02 PM	53.2	74.8	50.4
01:02 PM - 02:02 PM	74.2	86.7	60.1
02:02 PM - 03:02 PM	72.9	82.8	53.8
03:02 PM - 04:02 PM	70.1	82.2	52.8
04:02 PM - 05:02 PM	71.3	75.3	64.9
Leq Average 8 hrs. (dB(A))	72.8		
Lmax (dB(A))		86.7	
Standard (dB(A))	90	140	
Reference Method : Based on ISO1996-1 and 1996-2			
Standard : ประกาศกระทรวงอุตสาหกรรม เรื่อง มาตรการคุ้มครองความปลอดภัย ในการประกอบกิจการโรงงานเกี่ยวกับสภาวะแวดล้อมในการทำงาน พ.ศ.๒๕๔๖			

**Technical Management**

*Orawan R.*

Orawan Rakyong  
Scientist (3)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.  
31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110  
**P/O :** POWMS-24080058  
**Project Name :**  
**Project Location :**

**Lot ID: 24142108**

Date Received : Dec 25, 2024  
Date Reported : Dec 27, 2024  
Report Number : 3196492-1

Page 1 of 4

**Sample Number** 24142108-1  
**Sampled Date** Dec 23, 2024  
**Sample Description** Noise Dose  
**Location** พนักงานพื้นที่ระบบบำบัดน้ำเสียคนที่ 1  
**Personal Sampling** คุณเสลาบัตย์ นวลพรหม  
**Date Analysis Commenced** Dec 26, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
<b>Air Testing</b>									
Noise Dose (8 hrs.)	08:50 AM - 04:50 PM	%	-	1	16.6	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Bangkok
TWA (8 hrs.)	08:50 AM - 04:50 PM	dB(A)	-	-	77.2	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Bangkok

### Guideline :

- MOL : 1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)  
2. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)

**Sampled By :** Tana Supapan

### Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

Wichan Choonharat  
Assistant Manager

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.  
31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110  
**P/O :** POWMS-24080058  
**Project Name :**  
**Project Location :**

**Lot ID: 24142108**

Date Received : Dec 25, 2024  
Date Reported : Dec 27, 2024  
Report Number : 3196492-1

Page 2 of 4

**Sample Number** 24142108-2  
**Sampled Date** Dec 23, 2024  
**Sample Description** Noise Dose  
**Location** พนักงานพื้นที่ระบบบำบัดน้ำเสียคนที่ 2  
**Personal Sampling** คุณวีวัฒน์ ทองมาก  
**Date Analysis Commenced** Dec 26, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
<b>Air Testing</b>									
Noise Dose (8 hrs.)	08:50 AM - 04:50 PM	%	-	1	19.0	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Bangkok
TWA (8 hrs.)	08:50 AM - 04:50 PM	dB(A)	-	-	77.8	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Bangkok

### Guideline :

- MOL : 1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)  
2. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)

**Sampled By :** Tana Supapan

### Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

Wichan Choonharat  
Assistant Manager

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.  
31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110  
**P/O :** POWMS-24080058  
**Project Name :**  
**Project Location :**

**Lot ID: 24142108**

Date Received : Dec 25, 2024  
Date Reported : Dec 27, 2024  
Report Number : 3196492-1

Page 3 of 4

**Sample Number** 24142108-3  
**Sampled Date** Dec 23, 2024  
**Sample Description** Noise Dose  
**Location** พนักงานพื้นที่ระบบบำบัดน้ำเสียคนที่ 3  
**Personal Sampling** คุณธนพล บุญสุวรรณ  
**Date Analysis Commenced** Dec 26, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
<b>Air Testing</b>									
Noise Dose (8 hrs.)	08:49 AM - 04:49 PM	%	-	1	21.9	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Bangkok
TWA (8 hrs.)	08:49 AM - 04:49 PM	dB(A)	-	-	78.4	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Bangkok

### Guideline :

- MOL : 1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)  
2. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)

**Sampled By :** Tana Supapan

### Remark :

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

Wichan Choonharat  
Assistant Manager

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.  
31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla  
Thailand 90110  
**P/O :** POWMS-24080058  
**Project Name :**  
**Project Location :**

**Lot ID: 24142108**

Date Received : Dec 25, 2024  
Date Reported : Dec 27, 2024  
Report Number : 3196492-1

Page 4 of 4

**Sample Number** 24142108-4  
**Sampled Date** Dec 23, 2024  
**Sample Description** Noise Dose  
**Location** พนักงานพื้นที่ระบบบำบัดน้ำเสียคนที่ 4  
**Personal Sampling** คุณเนพดล ช่วยประสม  
**Date Analysis Commenced** Dec 26, 2024

Analyte	Sampled Date/time	Unit	LOD	LOQ (LOR)	Result	Guideline Limit	Method	Guideline	Testing Location
<b>Air Testing</b>									
Noise Dose (8 hrs.)	08:49 AM - 04:49 PM	%	-	1	15.5	No Standard	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Bangkok
TWA (8 hrs.)	08:49 AM - 04:49 PM	dB(A)	-	-	76.9	85	MOL, Department Labour Protection and Welfare (B.E.2561)	MOL	Bangkok

**Guideline :**

- MOL : 1. Notification of Department Labour Protection and Welfare on the Criteria and Procedures for Measurement and Analysis of Working Conditions in relation to Heat, Light or Noise Levels, including Duration and Types of Business that must perform (B.E. 2561)  
2. Notification of Department of Labour Protection and Welfare on the Standard of Time Weighted Average (TWA) Noise Level (B.E. 2561)

**Sampled By :** Tana Supapan

**Remark :**

- LOD : Limit of Detection
- "<" : Lower than LOQ (Limit of Quantitation) / LOR (Limit of Reporting)

Approved by

Wichan Choonharat  
Assistant Manager

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ภาคผนวก ค-4

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ผลการตรวจวิเคราะห์เสี่ยง



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207728-1

Page 1 of 1

<b>Sample Number</b>	24135041-1
<b>Parameter</b>	Noise (Leq 8 hrs.)
<b>Location</b>	สถานที่ 1 : ริมรั้วโครงการด้านทิศตะวันออก (N1) พิกัดละติจูด ลองจิจูด (GPS 47N 650072, 774302)
<b>Measurement Date</b>	Dec 20, 2024
<b>Measurement by</b>	Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	57.0	82.2	48.2
10:00 AM - 11:00 AM	64.0	93.9	53.3
11:00 AM - 12:00 PM	56.4	72.7	48.1
12:00 PM - 01:00 PM	58.8	88.4	47.6
01:00 PM - 02:00 PM	58.8	79.3	50.0
02:00 PM - 03:00 PM	65.6	88.3	48.9
03:00 PM - 04:00 PM	63.9	83.8	49.1
04:00 PM - 05:00 PM	56.9	83.2	48.2
Leq Average 8 hrs. (dB(A))	61.6		
Lmax (dB(A))		93.9	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207729-1

Page 1 of 1

<b>Sample Number</b>	24135041-2
<b>Parameter</b>	Noise (Leq 8 hrs.)
<b>Location</b>	สถานที่ 1 : ริมรั้วโครงการด้านทิศตะวันออก (N1) พิกัดละติจูด ลองจิจูด (GPS 47N 650072, 774302)
<b>Measurement Date</b>	Dec 21, 2024
<b>Measurement by</b>	Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	53.0	72.0	47.9
10:00 AM - 11:00 AM	52.9	72.6	48.2
11:00 AM - 12:00 PM	51.5	69.5	47.5
12:00 PM - 01:00 PM	53.8	71.9	47.6
01:00 PM - 02:00 PM	52.3	72.9	46.9
02:00 PM - 03:00 PM	52.8	78.1	47.8
03:00 PM - 04:00 PM	50.1	69.7	47.7
04:00 PM - 05:00 PM	49.2	71.4	47.1
Leq Average 8 hrs. (dB(A))	52.2		
Lmax (dB(A))		78.1	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207730-1

Page 1 of 1

<b>Sample Number</b>	24135041-3
<b>Parameter</b>	Noise (Leq 8 hrs.)
<b>Location</b>	สถานที่ 1 : ริมรั้วโครงการด้านทิศตะวันออก (N1) พิกัดละติจูด ลองจิจูด (GPS 47N 650072, 774302)
<b>Measurement Date</b>	Dec 22, 2024
<b>Measurement by</b>	Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	54.2	77.1	48.9
10:00 AM - 11:00 AM	54.4	74.5	48.6
11:00 AM - 12:00 PM	60.2	85.1	47.6
12:00 PM - 01:00 PM	52.4	76.8	46.8
01:00 PM - 02:00 PM	49.4	70.7	46.0
02:00 PM - 03:00 PM	52.3	74.2	46.3
03:00 PM - 04:00 PM	54.2	77.8	45.9
04:00 PM - 05:00 PM	48.3	64.6	45.7
Leq Average 8 hrs. (dB(A))	54.7		
Lmax (dB(A))		85.1	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207731-1

Page 1 of 1

<b>Sample Number</b>	24135041-4
<b>Parameter</b>	Noise (Leq 8 hrs.)
<b>Location</b>	สถานที่ 1 : ริมรั้วโครงการด้านทิศตะวันออก (N1) พิกัดละติจูด ลองจิจูด (GPS 47N 650072, 774302)
<b>Measurement Date</b>	Dec 23, 2024
<b>Measurement by</b>	Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	59.8	86.4	48.2
10:00 AM - 11:00 AM	57.1	77.9	49.1
11:00 AM - 12:00 PM	62.4	78.7	54.8
12:00 PM - 01:00 PM	58.2	77.9	47.6
01:00 PM - 02:00 PM	54.6	77.7	46.8
02:00 PM - 03:00 PM	60.8	83.1	54.5
03:00 PM - 04:00 PM	56.7	80.7	48.7
04:00 PM - 05:00 PM	59.4	76.1	52.6
Leq Average 8 hrs. (dB(A))	59.2		
Lmax (dB(A))		86.4	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207732-1

Page 1 of 1

**Sample Number** 24135041-5  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 1 : ริมรั้วโครงการด้านทิศตะวันออก (N1) พิกัดละติจูด ลองจิจูด (GPS 47N 650072, 774302)  
**Measurement Date** Dec 24, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	60.4	80.9	48.3
10:00 AM - 11:00 AM	57.4	78.8	48.7
11:00 AM - 12:00 PM	64.2	88.0	54.6
12:00 PM - 01:00 PM	60.0	80.0	48.8
01:00 PM - 02:00 PM	53.0	76.6	47.3
02:00 PM - 03:00 PM	69.5	88.8	56.1
03:00 PM - 04:00 PM	57.3	77.5	49.8
04:00 PM - 05:00 PM	57.8	74.1	51.3
Leq Average 8 hrs. (dB(A))	62.9		
Lmax (dB(A))		88.8	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head





## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207733-1

Page 1 of 1

**Sample Number** 24135041-6  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 1 : ริมรั้วโครงการด้านทิศตะวันออก (N1) พิกัดละติจูด ลองจิจูด (GPS 47N 650072, 774302)  
**Measurement Date** Dec 25, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	55.3	80.4	46.7
10:00 AM - 11:00 AM	53.0	73.2	48.1
11:00 AM - 12:00 PM	59.3	82.1	51.8
12:00 PM - 01:00 PM	51.7	70.4	46.7
01:00 PM - 02:00 PM	51.6	69.8	46.6
02:00 PM - 03:00 PM	56.6	73.2	52.1
03:00 PM - 04:00 PM	51.7	65.2	47.6
04:00 PM - 05:00 PM	57.4	81.3	52.4
Leq Average 8 hrs. (dB(A))	55.5		
Lmax (dB(A))		82.1	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207734-1

Page 1 of 1

**Sample Number** 24135041-7  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 1 : ริมรั้วโครงการด้านทิศตะวันออก (N1) พิกัดละติจูด ลองจิจูด (GPS 47N 650072, 774302)  
**Measurement Date** Dec 26, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	56.8	75.8	44.0
10:00 AM - 11:00 AM	59.9	74.0	47.0
11:00 AM - 12:00 PM	61.1	83.0	47.0
12:00 PM - 01:00 PM	58.8	76.9	46.9
01:00 PM - 02:00 PM	50.2	72.1	43.1
02:00 PM - 03:00 PM	57.2	74.9	51.7
03:00 PM - 04:00 PM	53.5	69.7	46.4
04:00 PM - 05:00 PM	57.9	77.1	47.5
Leq Average 8 hrs. (dB(A))	57.9		
Lmax (dB(A))		83.0	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207735-1

Page 1 of 1

**Sample Number** 24135041-8  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 2 : ริมรั้วโครงการด้านทิศเหนือ (N2) พิกัดละติจูด ลองจิจูด (GPS 47N 650017, 774310)  
**Measurement Date** Dec 20, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	67.6	82.2	59.4
10:00 AM - 11:00 AM	62.5	80.5	46.2
11:00 AM - 12:00 PM	58.5	81.5	45.3
12:00 PM - 01:00 PM	65.3	82.0	55.1
01:00 PM - 02:00 PM	58.9	79.0	46.8
02:00 PM - 03:00 PM	64.5	81.3	50.4
03:00 PM - 04:00 PM	63.3	82.5	48.1
04:00 PM - 05:00 PM	60.3	78.6	45.2
Leq Average 8 hrs. (dB(A))	63.6		
Lmax (dB(A))		82.5	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207736-1

Page 1 of 1

**Sample Number** 24135041-9  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 2 : ริมรั้วโครงการด้านทิศเหนือ (N2) พิกัดละติจูด ลองจิจูด (GPS 47N 650017, 774310)  
**Measurement Date** Dec 21, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	51.4	74.7	43.9
10:00 AM - 11:00 AM	52.4	71.1	45.3
11:00 AM - 12:00 PM	47.3	61.1	44.8
12:00 PM - 01:00 PM	62.4	89.5	44.0
01:00 PM - 02:00 PM	54.0	79.8	43.6
02:00 PM - 03:00 PM	50.7	72.8	44.7
03:00 PM - 04:00 PM	47.6	69.7	45.0
04:00 PM - 05:00 PM	48.2	67.7	44.2
Leq Average 8 hrs. (dB(A))	55.1		
Lmax (dB(A))		89.5	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207737-1

Page 1 of 1

**Sample Number** 24135041-10  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 2 : ริมรั้วโครงการด้านทิศเหนือ (N2) พิกัดละติจูด ลองจิจูด (GPS 47N 650017, 774310)  
**Measurement Date** Dec 22, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	51.7	63.1	43.7
10:00 AM - 11:00 AM	57.4	83.2	44.3
11:00 AM - 12:00 PM	54.7	77.6	41.8
12:00 PM - 01:00 PM	58.1	79.2	42.0
01:00 PM - 02:00 PM	55.3	74.6	42.9
02:00 PM - 03:00 PM	46.7	69.0	41.4
03:00 PM - 04:00 PM	54.1	77.1	41.8
04:00 PM - 05:00 PM	55.3	78.1	41.6
Leq Average 8 hrs. (dB(A))	55.2		
Lmax (dB(A))		83.2	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207738-1

Page 1 of 1

**Sample Number** 24135041-11  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 2 : ริมรั้วโครงการด้านทิศเหนือ (N2) พิกัดละติจูด ลองจิจูด (GPS 47N 650017, 774310)  
**Measurement Date** Dec 23, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	61.7	79.2	47.6
10:00 AM - 11:00 AM	59.6	75.5	43.2
11:00 AM - 12:00 PM	63.4	78.9	60.0
12:00 PM - 01:00 PM	61.4	81.4	43.9
01:00 PM - 02:00 PM	55.7	71.7	42.9
02:00 PM - 03:00 PM	61.9	76.9	59.4
03:00 PM - 04:00 PM	66.9	88.2	44.3
04:00 PM - 05:00 PM	61.2	76.8	50.6
Leq Average 8 hrs. (dB(A))	62.5		
Lmax (dB(A))		88.2	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207739-1

Page 1 of 1

**Sample Number** 24135041-12  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 2 : ริมรั้วโครงการด้านทิศเหนือ (N2) พิกัดละติจูด ลองจิจูด (GPS 47N 650017, 774310)  
**Measurement Date** Dec 24, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	59.4	78.7	44.6
10:00 AM - 11:00 AM	57.6	76.5	45.3
11:00 AM - 12:00 PM	63.3	83.6	49.8
12:00 PM - 01:00 PM	58.6	76.8	46.3
01:00 PM - 02:00 PM	49.9	68.8	44.8
02:00 PM - 03:00 PM	63.6	78.6	51.4
03:00 PM - 04:00 PM	63.8	83.5	48.2
04:00 PM - 05:00 PM	64.7	85.6	50.8
Leq Average 8 hrs. (dB(A))	61.8		
Lmax (dB(A))		85.6	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

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**Approved by**

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Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207740-1

Page 1 of 1

**Sample Number** 24135041-13  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 2 : ริมรั้วโครงการด้านทิศเหนือ (N2) พิกัดละติจูด ลองจิจูด (GPS 47N 650017, 774310)  
**Measurement Date** Dec 25, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	61.0	77.7	43.3
10:00 AM - 11:00 AM	59.9	76.1	49.0
11:00 AM - 12:00 PM	58.8	74.6	44.4
12:00 PM - 01:00 PM	62.2	80.0	58.3
01:00 PM - 02:00 PM	48.4	71.6	43.2
02:00 PM - 03:00 PM	62.6	86.8	43.6
03:00 PM - 04:00 PM	60.3	80.2	51.6
04:00 PM - 05:00 PM	56.9	73.6	43.9
Leq Average 8 hrs. (dB(A))	60.1		
Lmax (dB(A))		86.8	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207741-1

Page 1 of 1

<b>Sample Number</b>	24135041-14		
<b>Parameter</b>	Noise (Leq 8 hrs.)		
<b>Location</b>	สถานที่ 2 : ริมรั้วโครงการด้านทิศเหนือ (N2) พิกัดละติจูด ลองจิจูด (GPS 47N 650017, 774310)		
<b>Measurement Date</b>	Dec 26, 2024		
<b>Measurement by</b>	Narathorn Keawpongsa		

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	59.0	74.8	41.0
10:00 AM - 11:00 AM	59.3	85.4	44.2
11:00 AM - 12:00 PM	59.2	76.0	43.4
12:00 PM - 01:00 PM	59.8	82.8	45.8
01:00 PM - 02:00 PM	56.6	79.7	41.8
02:00 PM - 03:00 PM	58.4	76.2	56.0
03:00 PM - 04:00 PM	58.0	71.1	44.1
04:00 PM - 05:00 PM	58.5	76.0	45.3
Leq Average 8 hrs. (dB(A))	58.7		
Lmax (dB(A))		85.4	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207742-1

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**Sample Number** 24135041-15  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 3 : ริมรั้วโครงการด้านทิศตะวันตก (N3) พิกัดละติจูด ลองจิจูด (GPS 47N 649978, 774261)  
**Measurement Date** Dec 20, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	63.9	84.5	47.3
10:00 AM - 11:00 AM	63.9	79.0	48.0
11:00 AM - 12:00 PM	48.3	65.1	45.1
12:00 PM - 01:00 PM	63.2	86.7	48.0
01:00 PM - 02:00 PM	61.4	76.0	50.2
02:00 PM - 03:00 PM	61.8	84.5	48.1
03:00 PM - 04:00 PM	64.8	88.1	51.0
04:00 PM - 05:00 PM	59.0	86.1	47.8
Leq Average 8 hrs. (dB(A))	62.4		
Lmax (dB(A))		88.1	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207743-1

Page 1 of 1

**Sample Number** 24135041-16  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 3 : ริมรั้วโครงการด้านทิศตะวันตก (N3) พิกัดละติจูด ลองจิจูด (GPS 47N 649978, 774261)  
**Measurement Date** Dec 21, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	51.5	70.1	46.4
10:00 AM - 11:00 AM	53.6	80.3	47.1
11:00 AM - 12:00 PM	49.7	66.7	46.7
12:00 PM - 01:00 PM	65.1	88.6	47.4
01:00 PM - 02:00 PM	66.7	93.6	45.8
02:00 PM - 03:00 PM	64.4	90.8	46.5
03:00 PM - 04:00 PM	48.0	61.2	46.2
04:00 PM - 05:00 PM	48.8	65.4	46.7
Leq Average 8 hrs. (dB(A))	61.5		
Lmax (dB(A))		93.6	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207744-1

Page 1 of 1

**Sample Number** 24135041-17  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 3 : ริมรั้วโครงการด้านทิศตะวันตก (N3) พิกัดละติจูด ลองจิจูด (GPS 47N 649978, 774261)  
**Measurement Date** Dec 22, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	53.2	72.6	45.9
10:00 AM - 11:00 AM	59.5	77.7	46.7
11:00 AM - 12:00 PM	55.1	72.5	45.1
12:00 PM - 01:00 PM	49.2	66.2	45.7
01:00 PM - 02:00 PM	56.0	78.3	46.3
02:00 PM - 03:00 PM	55.5	80.9	45.7
03:00 PM - 04:00 PM	50.3	68.8	46.2
04:00 PM - 05:00 PM	50.5	72.4	45.9
Leq Average 8 hrs. (dB(A))	54.9		
Lmax (dB(A))		80.9	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

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**Approved by**

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand  
90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207745-1

Page 1 of 1

**Sample Number** 24135041-18  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 3 : ริมรั้วโครงการด้านทิศตะวันตก (N3) พิกัดละติจูด ลองจิจูด (GPS 47N 649978, 774261)  
**Measurement Date** Dec 23, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	61.0	77.7	47.1
10:00 AM - 11:00 AM	66.8	81.7	60.5
11:00 AM - 12:00 PM	66.2	87.5	46.1
12:00 PM - 01:00 PM	64.9	84.8	45.5
01:00 PM - 02:00 PM	65.6	90.9	58.5
02:00 PM - 03:00 PM	58.8	72.0	47.4
03:00 PM - 04:00 PM	64.2	75.1	57.2
04:00 PM - 05:00 PM	55.7	69.9	46.4
Leq Average 8 hrs. (dB(A))	64.1		
Lmax (dB(A))		90.9	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207746-1

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**Sample Number** 24135041-19  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 3 : ริมรั้วโครงการด้านทิศตะวันตก (N3) พิกัดละติจูด ลองจิจูด (GPS 47N 649978, 774261)  
**Measurement Date** Dec 24, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	64.2	83.8	52.5
10:00 AM - 11:00 AM	57.8	66.6	56.0
11:00 AM - 12:00 PM	58.1	74.0	47.9
12:00 PM - 01:00 PM	68.7	85.8	54.0
01:00 PM - 02:00 PM	59.6	74.6	47.2
02:00 PM - 03:00 PM	58.8	74.3	46.9
03:00 PM - 04:00 PM	65.5	81.9	59.9
04:00 PM - 05:00 PM	62.4	87.5	48.3
Leq Average 8 hrs. (dB(A))	63.6		
Lmax (dB(A))		87.5	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207747-1

Page 1 of 1

**Sample Number** 24135041-20  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 3 : ริมรั้วโครงการด้านทิศตะวันตก (N3) พิกัดละติจูด ลองจิจูด (GPS 47N 649978, 774261)  
**Measurement Date** Dec 25, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	59.1	77.8	46.8
10:00 AM - 11:00 AM	63.5	87.7	57.2
11:00 AM - 12:00 PM	51.0	74.5	44.5
12:00 PM - 01:00 PM	60.9	83.6	44.3
01:00 PM - 02:00 PM	59.4	73.0	52.3
02:00 PM - 03:00 PM	58.8	75.9	45.4
03:00 PM - 04:00 PM	61.7	78.1	55.3
04:00 PM - 05:00 PM	54.4	74.6	45.2
Leq Average 8 hrs. (dB(A))	59.9		
Lmax (dB(A))		87.7	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

*Saranya C.*

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Scientist (4)

**Approved by**

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Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand  
90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207748-1

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**Sample Number** 24135041-21  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 3 : ริมรั้วโครงการด้านทิศตะวันตก (N3) พิกัดละติจูด ลองจิจูด (GPS 47N 649978, 774261)  
**Measurement Date** Dec 26, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	63.3	79.2	46.1
10:00 AM - 11:00 AM	66.1	88.4	46.7
11:00 AM - 12:00 PM	68.7	94.3	48.3
12:00 PM - 01:00 PM	52.6	75.0	40.3
01:00 PM - 02:00 PM	61.0	76.4	56.9
02:00 PM - 03:00 PM	62.2	77.7	44.0
03:00 PM - 04:00 PM	63.6	88.1	45.6
04:00 PM - 05:00 PM	62.3	84.0	56.6
Leq Average 8 hrs. (dB(A))	64.1		
Lmax (dB(A))		94.3	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207749-1

Page 1 of 1

**Sample Number** 24135041-22  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 4 : ริมรั้วโครงการด้านทิศใต้ (N4) พิกัดละติจูด ลองจิจูด (GPS 47N 650054, 774263)  
**Measurement Date** Dec 20, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	57.9	72.9	53.0
10:00 AM - 11:00 AM	53.6	63.4	52.7
11:00 AM - 12:00 PM	60.3	69.4	55.1
12:00 PM - 01:00 PM	61.8	78.1	54.8
01:00 PM - 02:00 PM	58.0	73.0	53.8
02:00 PM - 03:00 PM	55.1	69.1	52.5
03:00 PM - 04:00 PM	53.5	63.8	52.4
04:00 PM - 05:00 PM	57.9	73.3	51.6
Leq Average 8 hrs. (dB(A))	58.2		
Lmax (dB(A))		78.1	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

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## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207750-1

Page 1 of 1

**Sample Number** 24135041-23  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 4 : ริมรั้วโครงการด้านทิศใต้ (N4) พิกัดละติจูด ลองจิจูด (GPS 47N 650054, 774263)  
**Measurement Date** Dec 21, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	52.4	61.5	51.5
10:00 AM - 11:00 AM	52.3	61.5	51.6
11:00 AM - 12:00 PM	51.9	60.6	50.6
12:00 PM - 01:00 PM	51.0	61.9	50.2
01:00 PM - 02:00 PM	50.8	61.1	50.0
02:00 PM - 03:00 PM	51.4	65.7	50.0
03:00 PM - 04:00 PM	50.6	53.1	50.2
04:00 PM - 05:00 PM	50.6	57.3	50.1
Leq Average 8 hrs. (dB(A))	51.4		
Lmax (dB(A))		65.7	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

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Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207751-1

Page 1 of 1

**Sample Number** 24135041-24  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 4 : ริมรั้วโครงการด้านทิศใต้ (N4) พิกัดละติจูด ลองจิจูด (GPS 47N 650054, 774263)  
**Measurement Date** Dec 22, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	49.9	55.9	49.5
10:00 AM - 11:00 AM	50.2	56.4	49.6
11:00 AM - 12:00 PM	51.1	64.9	48.8
12:00 PM - 01:00 PM	48.7	56.3	48.1
01:00 PM - 02:00 PM	49.7	57.3	49.1
02:00 PM - 03:00 PM	50.3	61.1	49.6
03:00 PM - 04:00 PM	49.3	59.9	48.5
04:00 PM - 05:00 PM	50.4	52.9	50.0
Leq Average 8 hrs. (dB(A))	50.0		
Lmax (dB(A))		64.9	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207752-1

Page 1 of 1

**Sample Number** 24135041-25  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 4 : ริมรั้วโครงการด้านทิศใต้ (N4) พิกัดละติจูด ลองจิจูด (GPS 47N 650054, 774263)  
**Measurement Date** Dec 23, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	53.8	62.7	52.1
10:00 AM - 11:00 AM	56.3	67.2	52.4
11:00 AM - 12:00 PM	57.1	70.0	55.0
12:00 PM - 01:00 PM	56.1	69.5	53.0
01:00 PM - 02:00 PM	52.8	62.9	52.1
02:00 PM - 03:00 PM	53.8	66.6	52.0
03:00 PM - 04:00 PM	52.9	65.8	51.9
04:00 PM - 05:00 PM	57.3	68.9	54.7
Leq Average 8 hrs. (dB(A))	55.4		
Lmax (dB(A))		70.0	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207753-1

Page 1 of 1

**Sample Number** 24135041-26  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 4 : ริมรั้วโครงการด้านทิศใต้ (N4) พิกัดละติจูด ลองจิจูด (GPS 47N 650054, 774263)  
**Measurement Date** Dec 24, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	56.4	64.3	55.3
10:00 AM - 11:00 AM	56.0	71.0	52.7
11:00 AM - 12:00 PM	53.3	63.4	52.2
12:00 PM - 01:00 PM	55.6	62.5	54.8
01:00 PM - 02:00 PM	57.2	71.3	54.6
02:00 PM - 03:00 PM	58.3	76.8	56.1
03:00 PM - 04:00 PM	53.8	62.0	50.9
04:00 PM - 05:00 PM	50.9	61.3	49.0
Leq Average 8 hrs. (dB(A))	55.7		
Lmax (dB(A))		76.8	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207754-1

Page 1 of 1

**Sample Number** 24135041-27  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 4 : ริมรั้วโครงการด้านทิศใต้ (N4) พิกัดละติจูด ลองจิจูด (GPS 47N 650054, 774263)  
**Measurement Date** Dec 25, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	55.4	70.3	48.0
10:00 AM - 11:00 AM	59.8	77.4	44.0
11:00 AM - 12:00 PM	58.8	76.9	50.1
12:00 PM - 01:00 PM	55.1	70.4	49.6
01:00 PM - 02:00 PM	60.9	90.8	54.5
02:00 PM - 03:00 PM	56.0	70.5	45.7
03:00 PM - 04:00 PM	55.5	76.1	44.0
04:00 PM - 05:00 PM	53.8	71.5	41.8
Leq Average 8 hrs. (dB(A))	57.6		
Lmax (dB(A))		90.8	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24135041**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3207755-1

Page 1 of 1

**Sample Number** 24135041-28  
**Parameter** Noise (Leq 8 hrs.)  
**Location** สถานีที่ 4 : ริมรั้วโครงการด้านทิศใต้ (N4) พิกัดละติจูด ลองจิจูด (GPS 47N 650054, 774263)  
**Measurement Date** Dec 26, 2024  
**Measurement by** Narathorn Keawpongsa

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	57.4	74.6	52.0
10:00 AM - 11:00 AM	58.4	71.0	52.2
11:00 AM - 12:00 PM	57.4	71.5	51.2
12:00 PM - 01:00 PM	52.2	72.1	50.6
01:00 PM - 02:00 PM	58.1	78.2	54.7
02:00 PM - 03:00 PM	54.3	64.6	51.6
03:00 PM - 04:00 PM	57.6	69.9	51.8
04:00 PM - 05:00 PM	56.7	70.0	55.1
Leq Average 8 hrs. (dB(A))	56.9		
Lmax (dB(A))		78.2	
Reference Method : ISO1996-1 and 1996-2			

**Technical Management**

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Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24142106**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3208076-1

Page 1 of 1

<b>Sample Number</b>	24142106-1
<b>Parameter</b>	Noise (Leq 24 hrs.)
<b>Location</b>	สถานที่ที่ 1 : บริเวณริมรั้วบริษัทด้านทิศตะวันตก (ด้านหน้าทางเข้า-ออก STS1 และ STS2) (N5) พิกัดละติจูด ลองจิจูด (GPS 47N 649894, 774176)
<b>Measurement Date</b>	Dec 20 - Dec 21, 2024
<b>Measurement by</b>	Narathorn Keawpongsa
<b>Sound Level meter</b>	Serial No. 472131

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	71.4	92.7	62.9
10:00 AM - 11:00 AM	67.6	89.0	51.4
11:00 AM - 12:00 PM	65.8	92.3	49.3
12:00 PM - 01:00 PM	74.9	100.5	66.4
01:00 PM - 02:00 PM	72.8	94.7	56.0
02:00 PM - 03:00 PM	73.1	96.5	60.7
03:00 PM - 04:00 PM	65.7	88.7	51.0
04:00 PM - 05:00 PM	61.5	87.4	49.6
05:00 PM - 06:00 PM	58.6	96.1	47.1
06:00 PM - 07:00 PM	57.2	89.0	50.4
07:00 PM - 08:00 PM	50.9	69.4	48.5
08:00 PM - 09:00 PM	52.6	69.3	48.6
09:00 PM - 10:00 PM	49.9	62.9	46.5
10:00 PM - 11:00 PM	51.1	69.1	44.5
11:00 PM - 12:00 AM	47.7	58.2	44.2
12:00 AM - 01:00 AM	48.6	60.9	43.8
01:00 AM - 02:00 AM	46.2	58.5	43.4
02:00 AM - 03:00 AM	47.6	57.9	43.8
03:00 AM - 04:00 AM	48.8	59.3	45.0
04:00 AM - 05:00 AM	51.7	75.9	46.5
05:00 AM - 06:00 AM	58.2	81.3	46.7
06:00 AM - 07:00 AM	61.8	86.1	47.7
07:00 AM - 08:00 AM	59.1	85.1	46.2
08:00 AM - 09:00 AM	65.4	88.4	48.0

Leq Average 24 hrs. (dB(A))	66.5		
Lmax (dB(A))		100.5	
L90 (dB(A))			47.7
Ldn (dB(A))	67.4		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป  
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head





## Analysis / Test Report

Client : WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

P/O : POWMS-24080058

Project Name :

Project Location :

Lot ID: 24142106

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3208077-1

Page 1 of 1

**Sample Number** 24142106-2  
**Parameter** Noise (Leq 24 hrs.)  
**Location** สถานีที่ 1 : บริเวณริมรั้วบริษัทด้านทิศตะวันตก (ด้านหน้าทางเข้า-ออก STS1 และ STS2) (N5) พิกัดละติจูด ลองจิจูด (GPS 47N 649894, 774176)  
**Measurement Date** Dec 21 - Dec 22, 2024  
**Measurement by** Narathorn Keawpongsa  
**Sound Level meter** Serial No. 472131

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	59.8	89.1	45.5
10:00 AM - 11:00 AM	65.7	95.8	46.2
11:00 AM - 12:00 PM	61.1	88.0	45.3
12:00 PM - 01:00 PM	54.8	82.0	44.6
01:00 PM - 02:00 PM	59.5	94.1	45.4
02:00 PM - 03:00 PM	53.9	83.6	45.5
03:00 PM - 04:00 PM	60.2	92.9	46.2
04:00 PM - 05:00 PM	54.4	76.0	48.4
05:00 PM - 06:00 PM	51.0	70.1	46.0
06:00 PM - 07:00 PM	52.3	69.0	47.1
07:00 PM - 08:00 PM	51.7	64.6	46.6
08:00 PM - 09:00 PM	53.5	68.9	47.5
09:00 PM - 10:00 PM	50.1	60.3	46.9
10:00 PM - 11:00 PM	52.0	67.8	45.4
11:00 PM - 12:00 AM	51.1	67.6	46.6
12:00 AM - 01:00 AM	48.6	59.8	43.4
01:00 AM - 02:00 AM	45.9	56.0	42.2
02:00 AM - 03:00 AM	48.4	64.6	42.5
03:00 AM - 04:00 AM	59.7	68.8	48.3
04:00 AM - 05:00 AM	57.7	75.0	48.5
05:00 AM - 06:00 AM	56.5	86.5	45.9
06:00 AM - 07:00 AM	55.4	81.0	43.3
07:00 AM - 08:00 AM	59.3	80.1	45.2
08:00 AM - 09:00 AM	65.4	87.7	52.3

Leq Average 24 hrs. (dB(A)) 58.4  
Lmax (dB(A)) 95.8  
L90 (dB(A)) 45.9  
Ldn (dB(A)) 62.4  
Standard (dB(A)) 70

Reference Method : ISO1996-1 and 1996-2

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป  
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

Technical Management

Saranya C.

Saranya Chalermthamrong  
Scientist (4)

Approved by

Supot S.

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24142106**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3208078-1

Page 1 of 1

**Sample Number** 24142106-3  
**Parameter** Noise (Leq 24 hrs.)  
**Location** สถานีที่ 1 : บริเวณริมรั้วบริษัทด้านทิศตะวันตก (ด้านหน้าทางเข้า-ออก STS1 และ STS2) (N5) พิกัดละติจูด ลองจิจูด (GPS 47N 649894, 774176)  
**Measurement Date** Dec 22 - Dec 23, 2024  
**Measurement by** Narathorn Keawpongsa  
**Sound Level meter** Serial No. 472131

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	67.8	91.6	55.6
10:00 AM - 11:00 AM	64.4	82.1	43.3
11:00 AM - 12:00 PM	52.4	77.0	43.2
12:00 PM - 01:00 PM	64.0	84.3	45.1
01:00 PM - 02:00 PM	66.9	97.3	47.4
02:00 PM - 03:00 PM	67.7	92.1	48.4
03:00 PM - 04:00 PM	56.3	77.7	47.6
04:00 PM - 05:00 PM	59.5	79.3	49.8
05:00 PM - 06:00 PM	60.4	95.9	46.1
06:00 PM - 07:00 PM	50.5	74.5	45.2
07:00 PM - 08:00 PM	51.8	71.9	45.8
08:00 PM - 09:00 PM	49.8	68.9	46.7
09:00 PM - 10:00 PM	55.4	62.6	47.1
10:00 PM - 11:00 PM	56.0	64.2	46.6
11:00 PM - 12:00 AM	50.4	68.1	44.1
12:00 AM - 01:00 AM	52.5	61.9	45.6
01:00 AM - 02:00 AM	56.1	60.7	51.1
02:00 AM - 03:00 AM	51.9	58.5	46.0
03:00 AM - 04:00 AM	51.0	72.3	44.4
04:00 AM - 05:00 AM	53.0	72.6	46.7
05:00 AM - 06:00 AM	56.0	88.6	45.1
06:00 AM - 07:00 AM	59.8	87.8	46.8
07:00 AM - 08:00 AM	70.0	93.9	52.0
08:00 AM - 09:00 AM	71.6	92.7	62.0

Leq Average 24 hrs. (dB(A)) 63.4  
Lmax (dB(A)) 97.3  
L90 (dB(A)) 46.6  
Ldn (dB(A)) 65.2  
Standard (dB(A)) 70

Reference Method : ISO1996-1 and 1996-2

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป  
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24142106**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3208079-1

Page 1 of 1

**Sample Number** 24142106-4  
**Parameter** Noise (Leq 24 hrs.)  
**Location** สถานีที่ 1 : บริเวณริมรั้วบริษัทด้านทิศตะวันตก (ด้านหน้าทางเข้า-ออก STS1 และ STS2) (N5) พิกัดละติจูด ลองจิจูด (GPS 47N 649894, 774176)  
**Measurement Date** Dec 23 - Dec 24, 2024  
**Measurement by** Narathorn Keawpongsa  
**Sound Level meter** Serial No. 472131

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	72.2	94.2	64.0
10:00 AM - 11:00 AM	70.6	93.7	52.6
11:00 AM - 12:00 PM	61.7	84.3	49.6
12:00 PM - 01:00 PM	70.9	92.9	65.2
01:00 PM - 02:00 PM	67.8	86.8	50.0
02:00 PM - 03:00 PM	72.8	91.1	67.1
03:00 PM - 04:00 PM	68.3	89.5	48.9
04:00 PM - 05:00 PM	58.4	84.7	50.2
05:00 PM - 06:00 PM	58.8	82.6	45.4
06:00 PM - 07:00 PM	49.6	82.2	45.5
07:00 PM - 08:00 PM	52.8	71.0	49.7
08:00 PM - 09:00 PM	50.0	59.4	46.9
09:00 PM - 10:00 PM	49.4	55.3	47.7
10:00 PM - 11:00 PM	50.9	67.3	47.8
11:00 PM - 12:00 AM	49.1	66.6	46.6
12:00 AM - 01:00 AM	48.0	60.4	45.1
01:00 AM - 02:00 AM	45.8	53.8	43.4
02:00 AM - 03:00 AM	48.4	75.1	43.6
03:00 AM - 04:00 AM	48.2	67.4	44.8
04:00 AM - 05:00 AM	53.9	77.2	46.5
05:00 AM - 06:00 AM	56.2	87.7	46.7
06:00 AM - 07:00 AM	60.5	82.8	48.1
07:00 AM - 08:00 AM	66.8	88.6	53.1
08:00 AM - 09:00 AM	70.5	97.9	52.2

Leq Average 24 hrs. (dB(A)) 65.9  
Lmax (dB(A)) 97.9  
L90 (dB(A)) 47.8  
Ldn (dB(A)) 66.8

Standard (dB(A)) 70 115

Reference Method : ISO1996-1 and 1996-2

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป  
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24142106**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3208080-1

Page 1 of 1

**Sample Number** 24142106-5  
**Parameter** Noise (Leq 24 hrs.)  
**Location** สถานีที่ 1 : บริเวณริมรั้วบริษัทด้านทิศตะวันตก (ด้านหน้าทางเข้า-ออก STS1 และ STS2) (N5) พิกัดละติจูด ลองจิจูด (GPS 47N 649894, 774176)  
**Measurement Date** Dec 24 - Dec 25, 2024  
**Measurement by** Narathorn Keawpongsa  
**Sound Level meter** Serial No. 472131

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	71.1	89.0	51.1
10:00 AM - 11:00 AM	70.6	87.4	62.3
11:00 AM - 12:00 PM	61.1	86.4	50.8
12:00 PM - 01:00 PM	70.1	88.1	60.8
01:00 PM - 02:00 PM	71.1	90.8	57.3
02:00 PM - 03:00 PM	71.4	92.2	58.5
03:00 PM - 04:00 PM	70.8	89.0	59.9
04:00 PM - 05:00 PM	60.6	86.3	52.9
05:00 PM - 06:00 PM	66.5	96.9	47.3
06:00 PM - 07:00 PM	51.1	80.6	46.2
07:00 PM - 08:00 PM	53.1	69.3	46.6
08:00 PM - 09:00 PM	49.9	79.6	47.5
09:00 PM - 10:00 PM	49.3	72.8	47.3
10:00 PM - 11:00 PM	47.6	59.2	45.5
11:00 PM - 12:00 AM	51.3	84.4	44.4
12:00 AM - 01:00 AM	45.5	61.8	43.6
01:00 AM - 02:00 AM	44.4	65.0	43.0
02:00 AM - 03:00 AM	48.1	73.6	43.3
03:00 AM - 04:00 AM	49.2	68.4	43.9
04:00 AM - 05:00 AM	53.2	68.3	45.7
05:00 AM - 06:00 AM	54.8	87.9	45.9
06:00 AM - 07:00 AM	59.2	85.1	46.8
07:00 AM - 08:00 AM	65.8	90.1	48.1
08:00 AM - 09:00 AM	68.8	91.6	55.0

Leq Average 24 hrs. (dB(A))

65.9

Lmax (dB(A))

96.9

L90 (dB(A))

47.3

Ldn (dB(A))

66.6

Standard (dB(A))

70

115

Reference Method : ISO1996-1 and 1996-2

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป  
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24142106**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3208081-1

Page 1 of 1

<b>Sample Number</b>	24142106-6
<b>Parameter</b>	Noise (Leq 24 hrs.)
<b>Location</b>	สถานีที่ 1 : บริเวณริมรั้วบริษัทด้านทิศตะวันตก (ด้านหน้าทางเข้า-ออก STS1 และ STS2) (N5) พิกัดละติจูด ลองจิจูด (GPS 47N 649894, 774176)
<b>Measurement Date</b>	Dec 25 - Dec 26, 2024
<b>Measurement by</b>	Narathorn Keawpongsa
<b>Sound Level meter</b>	Serial No. 472131

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	70.3	95.6	58.9
10:00 AM - 11:00 AM	70.6	89.6	53.0
11:00 AM - 12:00 PM	58.7	82.7	48.5
12:00 PM - 01:00 PM	73.9	98.6	66.6
01:00 PM - 02:00 PM	72.7	98.2	52.7
02:00 PM - 03:00 PM	70.3	95.4	57.2
03:00 PM - 04:00 PM	72.0	92.0	59.8
04:00 PM - 05:00 PM	62.2	83.6	49.9
05:00 PM - 06:00 PM	64.0	94.1	45.9
06:00 PM - 07:00 PM	56.0	90.3	46.8
07:00 PM - 08:00 PM	56.5	69.3	47.4
08:00 PM - 09:00 PM	52.4	68.3	50.3
09:00 PM - 10:00 PM	51.4	57.3	48.5
10:00 PM - 11:00 PM	50.8	67.9	47.7
11:00 PM - 12:00 AM	50.5	72.8	45.8
12:00 AM - 01:00 AM	44.0	68.2	40.5
01:00 AM - 02:00 AM	41.6	54.4	39.8
02:00 AM - 03:00 AM	44.2	69.1	40.1
03:00 AM - 04:00 AM	49.9	71.3	40.6
04:00 AM - 05:00 AM	50.8	67.3	41.4
05:00 AM - 06:00 AM	51.7	80.7	43.4
06:00 AM - 07:00 AM	57.8	85.3	45.8
07:00 AM - 08:00 AM	67.8	98.5	45.5
08:00 AM - 09:00 AM	70.3	91.4	62.2

Leq Average 24 hrs. (dB(A))	66.8		
Lmax (dB(A))		98.6	
L90 (dB(A))			47.4
Ldn (dB(A))	67.2		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป  
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head



## Analysis / Test Report

**Client :** WMS Depot Co., Ltd.

31/9 Moo 4, Southern Industrial Estate, Tambon Chalung, Amphur Hatyai, Songkhla Thailand 90110

**P/O :** POWMS-24080058

**Project Name :**

**Project Location :**

**Lot ID: 24142106**

Date Received : Dec 28, 2024

Date Reported : Jan 06, 2025

Report Number: 3208082-1

Page 1 of 1

<b>Sample Number</b>	24142106-7
<b>Parameter</b>	Noise (Leq 24 hrs.)
<b>Location</b>	สถานที่ที่ 1 : บริเวณริมรั้วบริษัทด้านทิศตะวันตก (ด้านหน้าทางเข้า-ออก STS1 และ STS2) (N5) พิกัดละติจูด ลองจิจูด (GPS 47N 649894, 774176)
<b>Measurement Date</b>	Dec 26 - Dec 27, 2024
<b>Measurement by</b>	Narathorn Keawpongsa
<b>Sound Level meter</b>	Serial No. 472131

Time	Leq (dB(A))	Lmax (dB(A))	L90 (dB(A))
09:00 AM - 10:00 AM	68.9	92.2	50.1
10:00 AM - 11:00 AM	70.9	91.8	63.5
11:00 AM - 12:00 PM	62.0	86.0	48.5
12:00 PM - 01:00 PM	69.7	97.1	57.1
01:00 PM - 02:00 PM	71.7	97.5	64.8
02:00 PM - 03:00 PM	71.0	95.2	54.7
03:00 PM - 04:00 PM	71.7	91.7	55.7
04:00 PM - 05:00 PM	64.3	87.6	51.8
05:00 PM - 06:00 PM	67.8	90.7	48.3
06:00 PM - 07:00 PM	62.2	93.6	43.0
07:00 PM - 08:00 PM	51.9	69.1	47.8
08:00 PM - 09:00 PM	50.1	68.4	45.3
09:00 PM - 10:00 PM	48.1	59.9	44.9
10:00 PM - 11:00 PM	49.9	54.8	46.2
11:00 PM - 12:00 AM	52.5	68.2	44.8
12:00 AM - 01:00 AM	52.7	79.2	49.1
01:00 AM - 02:00 AM	47.9	55.5	44.4
02:00 AM - 03:00 AM	45.4	68.2	40.4
03:00 AM - 04:00 AM	52.1	71.6	41.8
04:00 AM - 05:00 AM	50.1	71.6	42.1
05:00 AM - 06:00 AM	54.7	79.0	46.3
06:00 AM - 07:00 AM	66.1	87.2	56.5
07:00 AM - 08:00 AM	64.1	91.3	52.5
08:00 AM - 09:00 AM	69.7	97.1	57.1

Leq Average 24 hrs. (dB(A))	66.2		
Lmax (dB(A))		97.5	
L90 (dB(A))			48.3
Ldn (dB(A))	67.9		
Standard (dB(A))	70	115	

Reference Method : ISO1996-1 and 1996-2

Standard : 1. ประกาศคณะกรรมการสิ่งแวดล้อมแห่งชาติ ฉบับที่ 15 (พ.ศ. 2540) เรื่องกำหนดมาตรฐานระดับเสียงโดยทั่วไป  
2. ประกาศกระทรวงอุตสาหกรรม เรื่องกำหนดค่าระดับเสียงการรบกวน และระดับเสียงที่เกิดจากการประกอบกิจการโรงงาน พ.ศ. 2548

**Technical Management**

*Saranya C.*

Saranya Chalermthamrong  
Scientist (4)

**Approved by**

*Supot S.*

Supot Salamteh  
Section Head

ภาคผนวก ค-5

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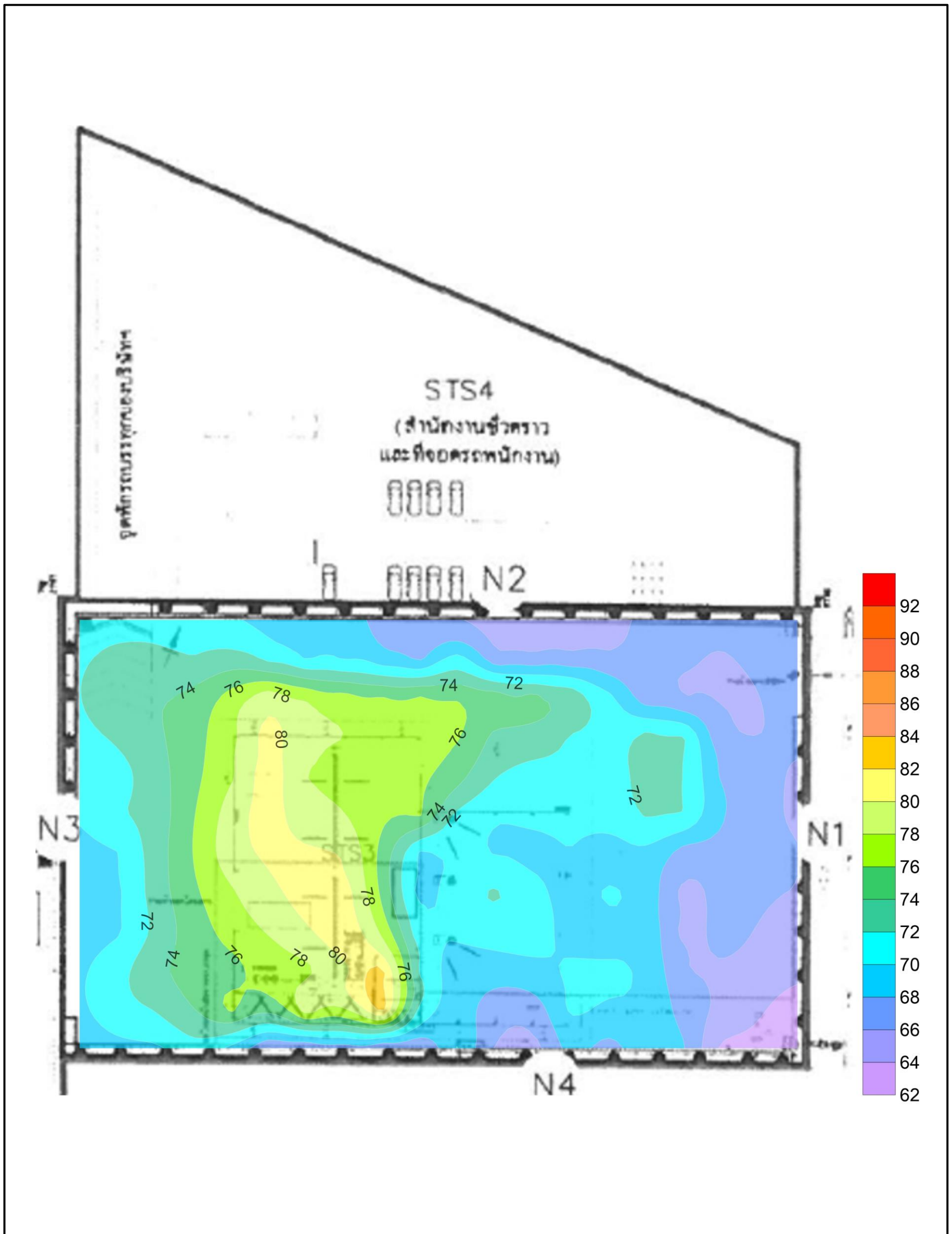
แผนที่แสดงระดับความดังของเสียง (Noise Contour Map)





Measurement Date : Dec 23, 2024

พื้นที่โครงการ



ADDRESS 104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan, Khet Suan Luang, Bangkok 10250, Thailand | PHONE +66 0 2760 3000 | FAX +66 0 2760 3197

ALS LABORATORY GROUP (THAILAND) CO., LTD. Part of the ALS Group

## Life Sciences

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ภาคผนวก ง

ใบรับรองเอกสารการสอบเทียบเครื่องมือตรวจวิเคราะห์



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right partner.

รายการเครื่องมือที่ใช้ในการวิเคราะห์ / ทดสอบ

Sample Name	Parameter	Equipment Name	ID No.	Calibrated Date	Next Cal	Freq. Calibrate (Months)
Noise	Noise Dose, TWA	Dose Badge Reader	SGK_FS0006	12-Jun-24	12-Jun-25	12
Noise	Leq 8 hrs	Sound Calibrator	SGK_FS0114	19-Dec-23	18-Dec-24	12
Noise	Leq 8 hrs	Sound Level Meter	SGK_FS0013	1-Oct-24	1-Oct-25	12
Noise	Leq 8 hrs	Sound Calibrator	SGK_FS0011	19-Oct-23	19-Oct-24	12
Noise	Leq 8 hrs	Sound Level Meter	SGK_FS0015	14-Aug-23	14-Aug-24	12
Noise	Leq 8 hrs	Sound Level Meter	SGK_FS0016	14-Aug-23	14-Aug-24	12
Noise	Leq 8 hrs	Sound Level Meter	SGK_FS0024	12-Jan-24	11-Jan-25	12
Noise	Leq 8 hrs	Sound Level Meter	SGK_FS0026	12-Jan-24	11-Jan-25	12
Noise	Leq 8 hrs	Sound Calibrator	SGK_FS0011	22-Oct-24	22-Oct-25	12
Noise	Leq 8 hrs	Sound Level Meter	SGK_FS0128	11-Mar-24	10-Mar-25	12
Noise	Leq 8 hrs	Sound Level Meter	SGK_FS0131	17-Jun-24	17-Jun-25	12
Noise	Leq 8 hrs	Sound Level Meter	SGK_FS0132	17-Jun-24	17-Jun-25	12
Noise	Leq 8 hrs	Sound Level Meter	SGK_FS0134	17-Jun-24	17-Jun-25	12
Noise	Leq 24 hrs	Sound Calibrator	SGK_FS0011	19-Oct-23	19-Oct-24	12
Noise	Leq 24 hrs	Sound Level Meter	SGK_FS0134	17-Jun-24	17-Jun-25	12
Noise	Leq 24 hrs	Sound Level Meter	SGK_FS0015	1-Oct-24	1-Oct-25	12
Noise	Noise Contour	Sound Calibrator	SGK_FS0114	11-Dec-24	11-Dec-25	12
Noise	Noise Contour	Sound Level Meter	SGK_FS0129	11-Mar-24	10-Mar-25	12
Illuminance	Illuminance	Lux Meter	SGK_FS0020	26-Aug-24	26-Aug-25	12
Songkhla Lab	Arsenic	ICP-MS	SGK_CL0048	2-Aug-23	2-Feb-25	18
Songkhla Lab	Arsenic	Cold Room Water	SGK_CL0065	1-Jul-24	1-Jan-26	18
Songkhla Lab	BOD	Incubator	SGK_CL0028	13-Jul-23	13-Jan-25	18
Songkhla Lab	BOD	DO/BOD Analyser	SGK_CL0073	21-May-24	21-Nov-25	18
Songkhla Lab	Cadmium	ICP-MS	SGK_CL0048	2-Aug-23	2-Feb-25	18
Songkhla Lab	Cadmium	Cold Room Water	SGK_CL0065	1-Jul-24	1-Jan-26	18
Songkhla Lab	COD	COD Reactor	SGK_CL0085	24-Jan-24	24-Jan-25	12
Songkhla Lab	COD	Spectrophotometer	SGK_CL0038	24-Jan-24	24-Jan-25	12
Songkhla Lab	Color (at Original pH)	Spectrophotometer	SGK_CL0040	25-Jan-24	25-Jan-25	12
Songkhla Lab	Color (at pH 7.0)	Spectrophotometer	SGK_CL0040	25-Jan-24	25-Jan-25	12
Songkhla Lab	Hexavalent Chromium	Spectrophotometer	SGK_CL0040	25-Jan-24	25-Jan-25	12
Songkhla Lab	Hexavalent Chromium	Cold Room Water	SGK_CL0065	1-Jul-24	1-Jan-26	18
Songkhla Lab	Trivalent Chromium	Spectrophotometer	SGK_CL0040	25-Jan-24	25-Jan-25	12
Songkhla Lab	Trivalent Chromium	Cold Room Water	SGK_CL0065	1-Jul-24	1-Jan-26	18
Songkhla Lab	Lead	ICP-MS	SGK_CL0048	2-Aug-23	2-Feb-25	18
Songkhla Lab	Lead	Cold Room Water	SGK_CL0065	1-Jul-24	1-Jan-26	18
Songkhla Lab	Mercury	ICP-MS	SGK_CL0048	2-Aug-23	2-Feb-25	18
Songkhla Lab	Mercury	Cold Room Water	SGK_CL0065	1-Jul-24	1-Jan-26	18
Songkhla Lab	Oil & Grease	Electronic Top-Loading Balance	SGK_CL0045	15-Jan-24	15-Jan-25	12
Songkhla Lab	Oil & Grease	Oven	SGK_CL0024	19-Oct-24	19-Apr-26	18
Songkhla Lab	Oil & Grease	Water Bath	SGK_CL0035	13-Jul-23	13-Jan-25	18
Songkhla Lab	Total Dissolved Solids 180°C	Electronic Top-Loading Balance	SGK_CL0045	15-Jan-24	15-Jan-25	12
Songkhla Lab	Total Dissolved Solids 180°C	Oven	SGK_CL0024	19-Oct-24	19-Apr-26	18
Songkhla Lab	Total Suspended Solids	Electronic Top-Loading Balance	SGK_CL0045	15-Jan-24	15-Jan-25	12
Songkhla Lab	Total Suspended Solids	Oven	SGK_CL0024	19-Oct-24	19-Apr-26	18
Water Lab	pH at 25 °C	pH meter	BKK_EN0342	17-Oct-24	17-Oct-25	12
Water Lab	Lead	ICP-MS	BKK_EL0026	12-Dec-23	13-Jun-25	18
Water Lab	Lead	Hot Block	BKK_EL0054	22-Sep-23	22-Mar-25	18
Water Lab	Lead	Chamber (Cooling Room)	BKK_EN0167	6-Dec-23	6-Jun-25	18
Water Lab	Arsenic	ICP-MS	BKK_EL0026	12-Dec-23	13-Jun-25	18
Water Lab	Arsenic	Hot Block	BKK_EL0054	22-Sep-23	22-Mar-25	18
Water Lab	Arsenic	Chamber (Cooling Room)	BKK_EN0167	6-Dec-23	6-Jun-25	18
Water Lab	Cadmium	ICP-MS	BKK_EL0026	12-Dec-23	13-Jun-25	18
Water Lab	Cadmium	Hot Block	BKK_EL0054	22-Sep-23	22-Mar-25	18
Water Lab	Cadmium	Chamber (Cooling Room)	BKK_EN0167	6-Dec-23	6-Jun-25	18
Water Lab	Mercury	Mercury Analyzer	BKK_EL0128	6-Dec-23	6-Dec-24	12
Water Lab	Total Dissolved Solids 180°C	Electronic Top-Loading Balance	BKK_EN0003	2-Aug-24	2-Aug-25	12
Water Lab	Total Dissolved Solids 180°C	Oven	BKK_EN0273	14-May-24	14-Nov-25	18

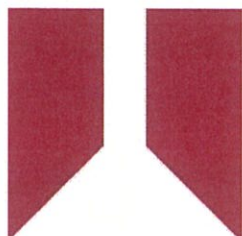
# CERTIFICATE OF CALIBRATION

ISSUED BY Cirrus Research plc

DATE OF ISSUE 12 June 2024

CERTIFICATE NUMBER 216165

REVIEW BY	Marakom R
APPROVED BY	
NEXT CAL. DATE	12/6/25



Cirrus Research plc  
Acoustic House  
Bridlington Road  
Hunmanby  
North Yorkshire  
YO14 0PH  
United Kingdom

Page 1 of 2

Approved signatory

N.Smith

Electronically signed:



## doseBadge Reader : IEC 60942:2003

### Instrument information

**Manufacturer:** Cirrus Research plc

**Notes:**

**Model:** RC:110A

**Serial number:** 79623

**Class:** 2

### Test summary

**Date of calibration:** 12 June 2024

The doseBadge reader detailed above has been calibrated to the published data as described in the operating manual and in the half-inch configuration. The procedures and techniques used are as described in IEC60942\_2003 Annex B – Periodic Tests and three determinations of the sound pressure level, frequency and total distortion were made.

The sound pressure level was measured using a WS2F condenser microphone type MK:224 manufactured by Cirrus Research plc.

The results have been corrected to the reference pressure of 101.33 kPa using the manufacturer's data.

The doseBadge Reader has been shown to conform to the Class 2 requirements for periodic testing, described in Annex B of IEC 60942:2003 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed.

However, as public evidence was not available, from a testing organisation responsible for pattern approval, to demonstrate that the model of doseBadge Reader conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, no general statement or conclusion can be made about conformance of the doseBadge Reader to the requirements of IEC 60942:2003.

**Notes:**

This certificate provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results within this certificate relate only to the items calibrated. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k=2$ , providing a coverage probability of approximately 95%.



# CERTIFICATE OF CALIBRATION

Certificate Number:

**216165**

Page 2 of 2

## Environmental conditions

The following conditions were recorded at the time of the test:

<b>Before</b>	Pressure: 101.19 kPa	Temperature: 22.2 °C	Humidity: 44.2 %
<b>After</b>	Pressure: 101.19 kPa	Temperature: 22.2 °C	Humidity: 43.6 %

## Test equipment

Equipment	Manufacturer	Model	Serial number
Distortion Meter	Keithley	2015	1053426
Acoustic Calibrator	Bruel and Kjaer	4231	2610257
Environmental Monitor	Comet	T7510	21962628

## Initial Acoustic Results

	Expected	Sample 1	Sample 2	Sample 3	Average	Deviation	Tolerance	Uncertainty
Level (dB)	114.00	113.95	113.93	113.93	<b>113.94</b>	-0.06	±0.75	0.11 dB
Distortion (%)	< 4.00	0.28	0.28	0.28	<b>0.28</b>	0.28	+4.00	0.13 %
Frequency (Hz)	1000.0	998.6	998.6	998.5	<b>998.5</b>	-1.5	±200.0	0.1 Hz

The measured quantities or deviations (as applicable), extended by the expanded combined uncertainty of measurement, must not exceed the corresponding tolerance.

## Adjusted Acoustic Results

	Expected	Sample 1	Sample 2	Sample 3	Average	Deviation	Tolerance	Uncertainty
Level (dB)	114.00	113.98	113.99	113.99	<b>113.99</b>	-0.01	±0.75	0.11 dB
Distortion (%)	< 4.00	0.28	0.28	0.28	<b>0.28</b>	0.28	+4.00	0.13 %
Frequency (Hz)	1000.0	998.5	998.5	998.5	<b>998.5</b>	-1.5	±200.0	0.1 Hz

## Functionality Results

Function	Result
Keypad	<b>Pass</b>
Battery Power	<b>Pass</b>
Display	<b>Pass</b>
Communication	<b>Pass</b>
2 way IR link	<b>Pass</b>
Clock	<b>Pass</b>

End of results

# SITHIPHORN ASSOCIATES CO.,LTD.

## CALIBRATION LABORATORY



NSC-TISI-TIS 17025  
CALIBRATION 0394

451-451/1 Sirinthorn Rd.,Bangbumru, Bangplud Bangkok 10700 THAILAND.  
Tel.0-2435-8800 Fax.0-2433-1679 e-mail:cal-center@sithiphorn.com http://www.sithiphorn.com

Cert. No. : ACC23047

Pages : 1 of 3

### Calibration Certificate

**Equipment :** SOUND CALIBRATOR  
**Manufacturer :** RION  
**Model :** NC-75  
**Serial No.:** 35024429  
**ID No.:** SGK\_FS0114

**Condition As Found :** GOOD

**Customer :** ALS LABORATORY GROUP (THAILAND) CO., LTD.  
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,  
KHWANG PHATTHANAKAN, KHET SUAN LUANG,  
BANGKOK, 10250 THAILAND.

**Location :** -  
**Ambient Temperature :** ( 23.0  $\pm$  3 ) °C  
**Pressure :** ( 101.3  $\pm$  3 ) kPa  
**Relative Humidity :** ( 50.0  $\pm$  20 ) %

**Received Date :** 28 NOVEMBER 2023  
**Calibration Date :** 19 DECEMBER 2023  
**Date of Issue :** 22 DECEMBER 2023

REVIEW BY	<i>Marakorn P</i>
APPROVED BY	<i>[Signature]</i>
NEXT CAL. DATE	18/12/24

**Calibrated by :** Nathakorn Pisutpaisan

**Approved by :**

*[Signature]*  
( Thanakul Petchurai )

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.



## Continuation of Calibration Certificate

Cert. No. : ACC23047

Job No. : VC67AC0036

Pages : 2 of 3

Calibration Procedure : CP-AC-03

## Calibration Method :

This equipment was calibrated by based on IEC-60942-2003 Standard.

The sound pressure level, frequency and total distortion of the sound calibrator was measured using the reference microphone.

## Condition of this result of calibration :

## 1. Reference Standard Instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL.BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL.BP 30/0267	13-FEB-24
Digital Multimeter	33461A	MY60024273	EEL.BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24
Audio Analyzer	AVR-3360A	V744B6069	EF-0012-23	10-FEB-24

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).

## Continuation of Calibration Certificate

Cert. No. : ACC23047

Job No. : VC67AC0036

Pages : 3 of 3

**Result of calibration :****1. Sound pressure level**

Specified sound pressure level (dB)	Measured value (dB)	Deviated value (dB)	Uncertainty (dB)	Acceptance limit (dB)
94	93.96	-0.04	0.14	0.40

**2. Frequency**

Specified Frequency (Hz)	Measured value (Hz)	Deviated value ( % )	Uncertainty ( % )	Acceptance limit ( % )
1000	1000.0	0.0	0.1	1.0

**3. Total distortion**

Measured value ( % )	Uncertainty ( % )	Acceptance limit ( % )
0.21	0.10	3.0

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 —————



Cert. No. : ACL24300

Pages : 1 of 8

## Calibration Certificate

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-42 / Microphone UC-52 / Preamplifier NH-24  
**Serial No.:** 00472128 / 170311 / 73011  
**ID No.:** SGK\_FS0013

**Condition As Found :** GOOD

**Customer :** ALS LABORATORY GROUP (THAILAND) CO., LTD.  
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,  
KHWANG PHATTHANAKAN, KHET SUAN LUANG,  
BANGKOK, 10250 THAILAND.

**Location :** -  
**Ambient Temperature :** ( 23.0  $\pm$  3 ) °C  
**Pressure :** ( 101.3  $\pm$  3 ) kPa  
**Relative Humidity :** ( 50.0  $\pm$  20 ) %

**Received Date :** 11 SEPTEMBER 2024  
**Calibration Date :** 01-02 OCTOBER 2024  
**Date of Issue :** 02 OCTOBER 2024

REVIEW BY	<i>Nathakorn P.</i>
APPROVED BY	<i>[Signature]</i>
NEXT CAL. DATE	1/10/25

**Calibrated by :**

Nathakorn Pisutpaisan

**Approved by :**

*T. Petchurai*  
( Thanakul Petchurai )

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.



# SITHIPORN ASSOCIATES CO., LTD.

## CALIBRATION LABORATORY

451-451/1 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand  
Tel. +66 2433 8331 Email : calibration@sithiporn.com



Cert. No. : ACL24300  
Job No. : VC67AC0157  
Pages : 2 of 8

Calibration Procedure : CP-AC-01

### Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).

The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments display and also with SLM's display.

### Condition of this result of calibration :

#### 1. Reference Standard Instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL.BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL.BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL.BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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).

*G. Petch*

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## CALIBRATION LABORATORY

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Cert. No. : ACL24300  
Job No. : VC67AC0157  
Pages : 3 of 8

### Summary of Measurement Result :

Parameter	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		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
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	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

*T. Ketch.*

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Cert. No. : ACL24300  
Job No. : VC67AC0157  
Page : 4 of 8

### Result of calibration :

#### 1. Absolute sensitivity

Reference Acoustic Signal ( dB )	Measured Value ( dB )	Deviation ( dB )	Acceptance Limit ( dB )
93.9 (93.94)	93.9	0.0	±0.3

#### 2. Self-generated noise

##### 2.1 Normal test

Measured Value ( dB )
20.3

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

Frequency Weighting	Weighting ( dB )
A - weight	13.4
C - weight	19.5
Flat	25.4

#### 3. Acoustical signal tests of frequency weightings

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

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	-0.2	-0.2	-0.2	± 1.5
1000	-0.3	-0.3	-0.3	± 1.0
8000	0.0	0.1	0.1	±5.0

*E. Petch-*



**Cert. No. : ACL24300**  
**Job No. : VC67AC0157**  
**Pages : 5 of 8**

#### 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

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

#### 5. Frequency and time weightings at 1 kHz

##### 5.1 Frequency weightings at 1 kHz

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

##### 5.2 Time weighting at 1 kHz

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

#### 6. Long - term stability

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

*T. Petcha*

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## CALIBRATION LABORATORY

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Cert. No. : ACL24300

Job No. : VC67AC0157

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### 7. Level linearity on the reference level range

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
137.0	137.0	0.0	$\pm 1.1$
136.0	136.0	0.0	$\pm 1.1$
135.0	135.0	0.0	$\pm 1.1$
134.0	134.0	0.0	$\pm 1.1$
133.0	133.0	0.0	$\pm 1.1$
132.0	132.0	0.0	$\pm 1.1$
131.0	131.0	0.0	$\pm 1.1$
129.0	129.0	0.0	$\pm 1.1$
124.0	124.0	0.0	$\pm 1.1$
119.0	119.0	0.0	$\pm 1.1$
114.0	114.0	0.0	$\pm 1.1$
109.0	109.0	0.0	$\pm 1.1$
104.0	104.0	0.0	$\pm 1.1$
99.0	99.0	0.0	$\pm 1.1$
94.0	94.0	0.0	$\pm 1.1$
89.0	89.1	0.1	$\pm 1.1$
84.0	84.1	0.1	$\pm 1.1$
79.0	79.0	0.0	$\pm 1.1$
74.0	74.1	0.1	$\pm 1.1$
69.0	69.1	0.1	$\pm 1.1$
64.0	64.0	0.0	$\pm 1.1$
59.0	59.1	0.1	$\pm 1.1$
54.0	54.0	0.0	$\pm 1.1$
49.0	49.0	0.0	$\pm 1.1$
44.0	44.0	0.0	$\pm 1.1$
39.0	39.0	0.0	$\pm 1.1$
34.0	34.0	0.0	$\pm 1.1$
30.0	30.1	0.1	$\pm 1.1$
29.0	29.1	0.1	$\pm 1.1$
28.0	28.1	0.1	$\pm 1.1$
27.0	27.2	0.2	$\pm 1.1$
26.0	26.2	0.2	$\pm 1.1$
25.0	25.2	0.2	$\pm 1.1$

*S. Petch*

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Cert. No. : ACL24300

Job No. : VC67AC0157

Pages : 7 of 8

### 8. Level linearity including the level range control

Range	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
130	30.0	29.9	-0.1	±1.1

### 9. Tone burst response

Time Weighting	Tone burst duration, Tb ( 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	117.0	0.0	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
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

*F. Ketch.*



**Cert. No. : ACL24300**  
**Job No. : VC67AC0157**  
**Pages : 8 of 8**

**10. Peak C sound level**

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value, L <sub>peak</sub> ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	133.0	133.0	0.0	±3.0
One	136.4	136.2	-0.2	±3.0

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	133.0	133.1	0.1	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.3	-0.1	±2.0

**11. Overload indication**

Measured value ( dB )		Deviated Value ( dB )	Acceptance Limits ( dB )
Positive one-half cycle	Negative one-half cycle		
89.6	89.7	0.1	±1.5

**12. High level stability**

Frequency Weighting	SLM Display at initial ( dB )	SLM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	137.0	137.0	0.0	±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** —————

*r. Retchu.*

# SITHIPHORN ASSOCIATES CO.,LTD.

## CALIBRATION LABORATORY



451-451/1 Sirinthorn Rd., Bangbunru, Bangplud Bangkok 10700 THAILAND.  
Tel.0-2435-8800 Fax.0-2433-1679 e-mail:cal-center@sithiphorn.com http://www.sithiphorn.com

Cert. No. : ACC23039

Pages : 1 of 3

### Calibration Certificate

**Equipment :** SOUND CALIBRATOR  
**Manufacturer :** RION  
**Model :** NC-74  
**Serial No.:** 34478386  
**ID No.:** SGK\_FS0011

**Condition As Found :** GOOD

**Customer :** ALS LABORATORY GROUP (THAILAND) CO., LTD.  
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,  
KHWANG PHATTHANAKAN, KHET SUAN LUANG,  
BANGKOK, 10250 THAILAND.

**Location :** -  
**Ambient Temperature :** ( 23.0  $\pm$  3 ) °C  
**Pressure :** ( 101.3  $\pm$  3 ) kPa  
**Relative Humidity :** ( 50.0  $\pm$  20 ) %

**Received Date :** 22 SEPTEMBER 2023  
**Calibration Date :** 19 OCTOBER 2023  
**Date of Issue :** 19 OCTOBER 2023

REVIEW BY	Nathakorn P.
APPROVED BY	[Signature]
NEXT CAL. DATE	19/10/24

**Calibrated by :** Nathakorn Pisutpaisan

**Approved by :**

[Signature]  
( Thanakul Petchurai )

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## Continuation of Calibration Certificate

Cert. No. : ACC23039

Job No. : VC66AC0101

Pages : 2 of 3

Calibration Procedure : CP-AC-03

**Calibration Method :**

This equipment was calibrated by based on IEC-60942-2003 Standard.

The sound pressure level, frequency and total distortion of the sound calibrator was measured using the reference microphone.

**Condition of this result of calibration :**

## 1. Reference Standard Instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL.BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL.BP 30/0267	13-FEB-24
Digital Multimeter	33461A	MY60024273	EEL.BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24
Audio Analyzer	AVR-3360A	V744B6069	EF-0012-23	10-FEB-24

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).

## Continuation of Calibration Certificate

Cert. No. : ACC23039

Job No. : VC66AC0101

Pages : 3 of 3

**Result of calibration :****1. Sound pressure level**

Specified sound pressure level (dB)	Measured value (dB)	Deviated value (dB)	Uncertainty (dB)	Acceptance limit (dB)
94	94.12	0.12	0.14	0.40

**2. Frequency**

Specified Frequency (Hz)	Measured value (Hz)	Deviated value ( % )	Uncertainty ( % )	Acceptance limit ( % )
1000	1002.5	0.3	0.1	1.0

**3. Total distortion**

Measured value ( % )	Uncertainty ( % )	Acceptance limit ( % )
2.11	0.10	3.0

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 —————



# SITHIPHORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

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Tel.0-2435-8800 Fax.0-2433-1679 e-mail:cal-center@sithiphorn.com http://www.sithiphorn.com



Cert. No. : ACL23253

Pages : 1 of 8

## Calibration Certificate

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-42/ Microphone UC-52 / Preamplifier NH-24  
**Serial No.:** 00472131 / 171451 / 73493  
**ID No.:** SGK\_FS0015

**Condition As Found :** GOOD

**Customer :** ALS LABORATORY GROUP (THAILAND) CO., LTD.  
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,  
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,  
BANGKOK, 10250 THAILAND.

**Location :** -  
**Ambient Temperature :** ( 23.0  $\pm$  3 ) °C  
**Pressure :** ( 101.3  $\pm$  3 ) kPa  
**Relative Humidity :** ( 50.0  $\pm$  20 ) %

**Received Date :** 25 JULY 2023  
**Calibration Date :** 14-15 AUGUST 2023  
**Date of Issue :** 22 AUGUST 2023

REVIEW BY	<i>Nathakorn P</i>
APPROVED BY	<i>[Signature]</i>
NEXT CAL. DATE	14/8/24

**Calibrated by :** Nathakorn Pisutpaisan

**Approved by :**

*[Signature]*  
( Thanakul Petchurai )

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## Continuation of Calibration Certificate

Cert. No. : ACL23253

Job No. : VC66AC0089

Pages : 2 of 8

Calibration Procedure : CP-AC-01

## Calibration Method :

This equipment was calibrated by based on IEC-61672-3 (2013) Standard for sound level meter (SLM).

The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments display and also with SLM's display.

## Condition of this result of calibration :

## 1. Reference Standard Instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL.BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL.BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL.BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24

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).



## Continuation of Calibration Certificate

**Cert. No. : ACL23253**  
**Job No. : VC66AC0089**  
**Pages : 3 of 8**

### 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				
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.6
8000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings				
For 10 Hz to 4 kHz	✓	-	0.3	0.6
For > 4 kHz to 10 kHz	✓	-	0.3	0.7
For > 10 kHz to 20 kHz	-	-	-	1.0
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	0.35
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

Note : Pass/Fail evaluation for each parameter, will be considered together from the acceptance limit and the Maximum-permitted uncertainty of measurement.

## Continuation of Calibration Certificate

Cert. No. : ACL23253

Job No. : VC66AC0089

Pages : 4 of 8

**Result of calibration :****1. Absolute sensitivity**

Reference Acoustic Signal ( dB )	Measured Value ( dB )	Deviation ( dB )	Acceptance Limit ( dB )
93.9 (93.98)	93.9	0.0	±0.3

**2. Self-generated noise**

## 2.1 Normal test

Measured Value ( dB )
14.6

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

Frequency Weighting	Measured value ( dB )
A - weight	11.2
C - weight	17.4
Flat	23.0

**3. Acoustical signal tests of frequency weightings**

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

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)			Acceptance Limits
	Flat	C-weight	A-weight	
125	0.3	0.3	0.3	± 1.5
1000	-0.1	0.0	0.0	± 1.0
8000	-0.2	-0.1	-0.1	±5.0



## Continuation of Calibration Certificate

Cert. No. : ACL23253

Job No. : VC66AC0089

Pages : 5 of 8

**4. Electrical signal tests of frequency weightings**

Weighting network response with relative to 1 kHz.

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

**5. Frequency and time weightings at 1 kHz**
**5.1 Frequency weightings at 1 kHz**

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

**5.2 Time weighting at 1 kHz**

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

**6. Long - term stability**

Frequency Weighting	SLM Display at initial ( dB )	SLM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	94.0	94.1	0.1	± 0.3

Continuation of Calibration Certificate

Cert. No. : ACL23253  
Job No. : VC66AC0089  
Pages : 6 of 8

**7. Level linearity on the reference level range**

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
137.0	137.0	0.0	± 1.1
136.0	136.0	0.0	± 1.1
135.0	135.0	0.0	± 1.1
134.0	134.0	0.0	± 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	119.0	0.0	± 1.1
114.0	114.0	0.0	± 1.1
109.0	109.0	0.0	± 1.1
104.0	104.1	0.1	± 1.1
99.0	99.0	0.0	± 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	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.1	0.1	± 1.1
27.0	27.0	0.0	± 1.1
26.0	26.1	0.1	± 1.1
25.0	25.0	0.0	± 1.1



## Continuation of Calibration Certificate

Cert. No. : ACL23253  
 Job No. : VC66AC0089  
 Pages : 7 of 8

**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, Tb ( ms )	Cycle	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Fast	0.25	1	108.0	108.0	0.0	1.5 ; -5.0
	2	8	117.0	117.0	0.0	1.0 ; -2.5
	200	800	134.0	134.1	0.1	±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
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	±1.0

**10. Peak C sound level**

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value, Lcpeak ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	133.0	133.0	0.0	±3.0
One	136.4	135.9	-0.5	±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	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

**Continuation of Calibration Certificate**

**Cert. No. : ACL23253**  
**Job No. : VC66AC0089**  
**Pages : 8 of 8**

**11. Overload indication**

Measured value ( dB )		Deviated Value ( dB )	Acceptance Limits ( dB )
Positive one-half cycle	Negative one-half cycle		
89.6	89.5	-0.1	±1.5

**12. High level stability**

Frequency Weighting	SLM Display at initial ( dB )	SLM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	137.0	137.0	0.0	±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**



# SITHIPHORN ASSOCIATES CO.,LTD. CALIBRATION LABORATORY

451-451/1 Sirinthorn Rd.,Bangbumru, Bangplud Bangkok 10700 THAILAND.  
Tel.0-2435-8800 Fax.0-2433-1679 e-mail:cal-center@sithiphorn.com http://www.sithiphorn.com



Cert. No. : ACL23254

Pages : 1 of 8

## Calibration Certificate

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-42/ Microphone UC-52 / Preamplifier NH-24  
**Serial No.:** 00472133 / 128482 / 72467  
**ID No.:** SGK\_FS0016

**Condition As Found :** GOOD

**Customer :** ALS LABORATORY GROUP (THAILAND) CO., LTD.  
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,  
KHWAENG PHATTHANAKAN, KHET SUAN LUANG,  
BANGKOK, 10250 THAILAND.

**Location :** -  
**Ambient Temperature :** ( 23.0  $\pm$  3 ) °C  
**Pressure :** ( 101.3  $\pm$  3 ) kPa  
**Relative Humidity :** ( 50.0  $\pm$  20 ) %

**Received Date :** 25 JULY 2023  
**Calibration Date :** 14-15 AUGUST 2023  
**Date of Issue :** 22 AUGUST 2023

REVIEW BY	<i>Nathakorn P.</i>
APPROVED BY	<i>[Signature]</i>
NEXT CAL. DATE	14/8/24

**Calibrated by :** Nathakorn Pisutpaisan

**Approved by :**

*T. Petchurai*  
( Thanakul Petchurai )

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.

Continuation of Calibration Certificate

**Cert. No. : ACL23254**  
**Job No. : VC66AC0089**  
**Pages : 2 of 8**

**Calibration Procedure :** CP-AC-01

**Calibration Method :**

This equipment was calibrated by based on IEC-61672-3 (2013) Standard for sound level meter (SLM).  
The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.  
For tests results of each items were made by observation of each Instruments display and also with SLM's display.

**Condition of this result of calibration :**

1. Reference Standard Instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL.BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL.BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL.BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24

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).



## Continuation of Calibration Certificate

Cert. No. : ACL23254

Job No. : VC66AC0089

Pages : 3 of 8

**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				
125 Hz	✓	-	0.3	0.6
1000 Hz	✓	-	0.3	0.6
8000 Hz	✓	-	0.3	0.7
4. Electrical signal tests of frequency weightings				
For 10 Hz to 4 kHz	✓	-	0.3	0.6
For > 4 kHz to 10 kHz	✓	-	0.3	0.7
For > 10 kHz to 20 kHz	-	-	-	1.0
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	0.35
11. Overload indication	✓	-	0.2	0.25
12. High level stability	✓	-	0.1	0.1

Note : Pass/Fail evaluation for each parameter,  
will be considered together from the acceptance limit and the Maximum-permitted uncertainty of measurement.

## Continuation of Calibration Certificate

Cert. No. : ACL23254

Job No. : VC66AC0089

Pages : 4 of 8

**Result of calibration :****1. Absolute sensitivity**

Reference Acoustic Signal ( dB )	Measured Value ( dB )	Deviation ( dB )	Acceptance Limit ( dB )
93.9 (93.98)	93.9	0.0	±0.3

**2. Self-generated noise**

## 2.1 Normal test

Measured Value ( dB )
17.5

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	24.0

**3. Acoustical signal tests of frequency weightings**

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

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.2	0.2	0.3	± 1.5
1000	-0.1	-0.2	-0.1	± 1.0
8000	-1.0	-1.0	-0.9	±5.0



**Continuation of Calibration Certificate**

**Cert. No. : ACL23254**

**Job No. : VC66AC0089**

**Pages : 5 of 8**

**4. Electrical signal tests of frequency weightings**

Weighting network response with relative to 1 kHz.

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

**5. Frequency and time weightings at 1 kHz**

**5.1 Frequency weightings at 1 kHz**

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

**5.2 Time weighting at 1 kHz**

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

**6. Long - term stability**

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

Continuation of Calibration Certificate

Cert. No. : ACL23254

Job No. : VC66AC0089

Pages : 6 of 8

**7. Level linearity on the reference level range**

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
137.0	137.1	0.1	± 1.1
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	109.0	0.0	± 1.1
104.0	104.1	0.1	± 1.1
99.0	99.0	0.0	± 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	30.0	0.0	± 1.1
29.0	29.0	0.0	± 1.1
28.0	28.1	0.1	± 1.1
27.0	27.1	0.1	± 1.1
26.0	26.1	0.1	± 1.1
25.0	25.2	0.2	± 1.1



Continuation of Calibration Certificate

Cert. No. : ACL23254  
Job No. : VC66AC0089  
Pages : 7 of 8

**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, Tb ( 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
SEL	0.25	1	99.0	98.8	-0.2	1.5 ; -5.0
	2	8	108.0	107.9	-0.1	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

**10. Peak C sound level**

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value, Lcpeak ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	133.0	133.0	0.0	±3.0
One	136.4	136.3	-0.1	±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	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.1	-0.3	±2.0

**Continuation of Calibration Certificate**

**Cert. No. : ACL23254**

**Job No. : VC66AC0089**

**Pages : 8 of 8**

**11. Overload indication**

Measured value ( dB )		Deviated Value ( dB )	Acceptance Limits ( dB )
Positive one-half cycle	Negative one-half cycle		
89.7	89.5	-0.2	±1.5

**12. High level stability**

Frequency Weighting	SLM Display at initial ( dB )	SLM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	137.0	137.0	0.0	±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**



Cert. No. : ACL24030  
Pages : 1 of 8

Calibration Certificate

Equipment : SOUND LEVEL METER  
Manufacturer : RION  
Model : NL-42 / Microphone UC-52 / Preamplifier NH-24  
Serial No.: 00672671 / 179122 / 87529  
ID No.: SGK\_FS0024

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.  
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,  
KHWANG PHATTHANAKAN, KHET SUAN LUANG,  
BANGKOK, 10250 THAILAND.

Location : -  
Ambient Temperature : ( 23.0 ± 3 ) °C  
Pressure : ( 101.3 ± 3 ) kPa  
Relative Humidity : ( 50.0 ± 20 ) %

Received Date : 05 JANUARY 2024  
Calibration Date : 12-15 JANUARY 2024  
Date of Issue : 16 JANUARY 2024

REVIEW BY *Nathakorn P.*  
APPROVED BY *[Signature]*  
NEXT CAL. DATE *11/1/25*

Calibrated by : Nathakorn Pisutpaisan

Approved by : *[Signature]*  
( Thanakul Petchurai )

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# SITHIPORN ASSOCIATES CO., LTD.

## CALIBRATION LABORATORY

451-451/1 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand  
Tel. +66 2433 8331 Email : calibration@sithiporn.com



**Cert. No. : ACL24030**

**Job No. : VC67AC0051**

**Pages : 2 of 8**

**Calibration Procedure :** CP-AC-01

### Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).

The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments display and also with SLM's display.

### Condition of this result of calibration :

#### 1. Reference Standard Instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL.BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL.BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL.BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24

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).

A handwritten signature in blue ink, appearing to read 'T. Ketch.', is located at the bottom right of the page.

# SITHIPORN ASSOCIATES CO., LTD.

## CALIBRATION LABORATORY

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Tel. +66 2433 8331 Email : calibration@sithiporn.com

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Cert. No. : ACL24030  
Job No. : VC67AC0051  
Pages : 3 of 8

### Summary of Measurement Result :

Parameter	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		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	-	1.0
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	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

*T. Petch...*



# SITHIPORN ASSOCIATES CO., LTD.

## CALIBRATION LABORATORY

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Cert. No. : ACL24030

Job No. : VC67AC0051

Pages : 4 of 8

### Result of calibration :

#### 1. Absolute sensitivity

Reference Acoustic Signal ( dB )	Measured Value ( dB )	Deviation ( dB )	Acceptance Limit ( dB )
93.9 (93.98)	93.9	0.0	±0.3

#### 2. Self-generated noise

##### 2.1 Normal test

Measured Value ( dB )
14.6

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

Frequency Weighting	Measured value ( dB )
A - weight	10.8
C - weight	17.1
Flat	22.9

#### 3. Acoustical signal tests of frequency weightings

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

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.3	0.3	0.3	± 1.5
1000	-0.1	-0.1	-0.1	± 1.0
8000	0.1	0.2	0.2	±5.0

*T. Pichan.*

# SITHIPORN ASSOCIATES CO., LTD.

## CALIBRATION LABORATORY

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Tel. +66 2433 8331 Email : calibration@sithiporn.com

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Cert. No. : ACL24030

Job No. : VC67AC0051

Pages : 5 of 8

#### 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

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

#### 5. Frequency and time weightings at 1 kHz

##### 5.1 Frequency weightings at 1 kHz

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

##### 5.2 Time weighting at 1 kHz

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

#### 6. Long - term stability

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

*T. P. P.*

# SITHIPORN ASSOCIATES CO., LTD.

## CALIBRATION LABORATORY

451-451/1 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand  
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Cert. No. : ACL24030

Job No. : VC67AC0051

Pages : 6 of 8

### 7. Level linearity on the reference level range

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
137.0	137.0	0.0	$\pm 1.1$
136.0	136.0	0.0	$\pm 1.1$
135.0	135.0	0.0	$\pm 1.1$
134.0	134.0	0.0	$\pm 1.1$
133.0	133.0	0.0	$\pm 1.1$
132.0	132.0	0.0	$\pm 1.1$
131.0	131.0	0.0	$\pm 1.1$
129.0	129.0	0.0	$\pm 1.1$
124.0	124.0	0.0	$\pm 1.1$
119.0	119.0	0.0	$\pm 1.1$
114.0	114.0	0.0	$\pm 1.1$
109.0	109.0	0.0	$\pm 1.1$
104.0	104.0	0.0	$\pm 1.1$
99.0	99.0	0.0	$\pm 1.1$
94.0	94.0	0.0	$\pm 1.1$
89.0	89.0	0.0	$\pm 1.1$
84.0	84.1	0.1	$\pm 1.1$
79.0	79.0	0.0	$\pm 1.1$
74.0	74.1	0.1	$\pm 1.1$
69.0	69.1	0.1	$\pm 1.1$
64.0	64.0	0.0	$\pm 1.1$
59.0	59.1	0.1	$\pm 1.1$
54.0	54.0	0.0	$\pm 1.1$
49.0	49.0	0.0	$\pm 1.1$
44.0	44.0	0.0	$\pm 1.1$
39.0	39.0	0.0	$\pm 1.1$
34.0	34.0	0.0	$\pm 1.1$
30.0	30.0	0.0	$\pm 1.1$
29.0	29.0	0.0	$\pm 1.1$
28.0	28.0	0.0	$\pm 1.1$
27.0	27.0	0.0	$\pm 1.1$
26.0	26.0	0.0	$\pm 1.1$
25.0	25.0	0.0	$\pm 1.1$

*T. Ketcha*



**Cert. No. : ACL24030**  
**Job No. : VC67AC0051**  
**Pages : 7 of 8**

**8. Level linearity including the level range control**

Range	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Auto	94.0	93.9	-0.1	±1.1

**9. Tone burst response**

Time Weighting	Tone burst duration, Tb ( 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	117.0	0.0	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
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

**10. Peak C sound level**

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value, Lcpeak ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	133.0	133.0	0.0	±3.0
One	136.4	136.3	-0.1	±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	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

*T. Petch*

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Job No. : VC67AC0051  
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### 11. Overload indication

Measured value ( dB )		Deviated Value ( dB )	Acceptance Limits ( dB )
Positive one-half cycle	Negative one-half cycle		
89.6	89.7	0.1	±1.5

### 12. High level stability

Frequency Weighting	SLM Display at initial ( dB )	SLM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	137.0	137.0	0.0	±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** —————

*G. Petcha*



**Cert. No. : ACL24032**

**Pages : 1 of 8**

## Calibration Certificate

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-42 / Microphone UC-52 / Preamplifier NH-24  
**Serial No.:** 00873118 / 182836 / 73494  
**ID No.:** SGK\_FS0026

**Condition As Found :** GOOD

**Customer :** ALS LABORATORY GROUP (THAILAND) CO., LTD.  
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,  
KHWANG PHATTHANAKAN, KHET SUAN LUANG,  
BANGKOK, 10250 THAILAND.

**Location :** -  
**Ambient Temperature :** ( 23.0  $\pm$  3 ) °C  
**Pressure :** ( 101.3  $\pm$  3 ) kPa  
**Relative Humidity :** ( 50.0  $\pm$  20 ) %

**Received Date :** 05 JANUARY 2024  
**Calibration Date :** 12-15 JANUARY 2024  
**Date of Issue :** 16 JANUARY 2024

REVIEW BY	<i>Nathakorn P</i>
APPROVED BY	<i>[Signature]</i>
NEXT CAL. DATE	11 / 1 / 25

**Calibrated by :** Nathakorn Pisutpaisan

**Approved by :**

*[Signature]*  
( Thanakul Petchurai )

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.

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## CALIBRATION LABORATORY

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Tel. +66 2433 8331 Email : calibration@sithiporn.com



Cert. No. : ACL24032  
Job No. : VC67AC0051  
Pages : 2 of 8

Calibration Procedure : CP-AC-01

### Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).

The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments display and also with SLM's display.

### Condition of this result of calibration :

#### 1. Reference Standard Instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
Waveform Generator	33210A	MY48017076	EF-0009-23	07-FEB-24
Waveform Generator	33511B	MY52302742	EF-0010-23	07-FEB-24
Digital Multimeter	33461A	MY53220104	EEL.BP 30/0266	13-FEB-24
Digital Multimeter	33461A	MY53220076	EEL.BP 29/0266	13-FEB-24
Digital Multimeter	34461A	MY60024273	EEL.BP 31/0266	14-FEB-24
Programmable Attenuator	MAT-1070	62100114	EF-0011-23	08-FEB-24
Condenser Microphone	4180	2977900	AA-1001-23	14-FEB-24
Measuring Amplifier	NA-42KAI	34560495	AA-3002-23	14-FEB-24

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).

*Signature*

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Job No. : VC67AC0051  
Pages : 3 of 8

### Summary of Measurement Result :

Parameter	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		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	-	1.0
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	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

*T. Ketcha*



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Cert. No. : ACL24032

Job No. : VC67AC0051

Pages : 4 of 8

### Result of calibration :

#### 1. Absolute sensitivity

Reference Acoustic Signal ( dB )	Measured Value ( dB )	Deviation ( dB )	Acceptance Limit ( dB )
93.9 (93.98)	93.9	0.0	±0.3

#### 2. Self-generated noise

##### 2.1 Normal test

Measured Value ( dB )
14.6

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

Frequency Weighting	Measured value ( dB )
A - weight	11.6
C - weight	17.8
Flat	23.5

#### 3. Acoustical signal tests of frequency weightings

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

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.0	0.0	0.0	± 1.5
1000	0.0	0.0	0.0	± 1.0
8000	1.5	1.5	1.6	±5.0

*7. Peter*

**Cert. No. : ACL24032**  
**Job No. : VC67AC0051**  
**Pages : 5 of 8**

#### 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

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

#### 5. Frequency and time weightings at 1 kHz

##### 5.1 Frequency weightings at 1 kHz

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

##### 5.2 Time weighting at 1 kHz

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

#### 6. Long - term stability

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

*G. Petch.*



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Job No. : VC67AC0051

Pages : 6 of 8

### 7. Level linearity on the reference level range

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
137.0	137.0	0.0	$\pm 1.1$
136.0	136.0	0.0	$\pm 1.1$
135.0	135.0	0.0	$\pm 1.1$
134.0	134.0	0.0	$\pm 1.1$
133.0	133.0	0.0	$\pm 1.1$
132.0	132.0	0.0	$\pm 1.1$
131.0	131.0	0.0	$\pm 1.1$
129.0	129.0	0.0	$\pm 1.1$
124.0	124.0	0.0	$\pm 1.1$
119.0	119.0	0.0	$\pm 1.1$
114.0	114.0	0.0	$\pm 1.1$
109.0	109.0	0.0	$\pm 1.1$
104.0	104.0	0.0	$\pm 1.1$
99.0	99.0	0.0	$\pm 1.1$
94.0	94.0	0.0	$\pm 1.1$
89.0	89.0	0.0	$\pm 1.1$
84.0	84.0	0.0	$\pm 1.1$
79.0	79.0	0.0	$\pm 1.1$
74.0	74.0	0.0	$\pm 1.1$
69.0	69.0	0.0	$\pm 1.1$
64.0	64.0	0.0	$\pm 1.1$
59.0	59.0	0.0	$\pm 1.1$
54.0	53.9	-0.1	$\pm 1.1$
49.0	49.0	0.0	$\pm 1.1$
44.0	43.9	-0.1	$\pm 1.1$
39.0	38.9	-0.1	$\pm 1.1$
34.0	34.0	0.0	$\pm 1.1$
30.0	30.0	0.0	$\pm 1.1$
29.0	29.0	0.0	$\pm 1.1$
28.0	28.0	0.0	$\pm 1.1$
27.0	27.0	0.0	$\pm 1.1$
26.0	26.1	0.1	$\pm 1.1$
25.0	25.1	0.1	$\pm 1.1$

*S. Petch*

**Cert. No. : ACL24032**  
**Job No. : VC67AC0051**  
**Pages : 7 of 8**

**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, Tb ( 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	117.0	0.0	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
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.0	0.0	±1.0

**10. Peak C sound level**

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value, Lcpeak ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	133.0	133.0	0.0	±3.0
One	136.4	136.3	-0.1	±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	±2.0
Positive half cycle	135.4	135.2	-0.2	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

*Z. Ratan*

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Job No. : VC67AC0051  
Pages : 8 of 8

### 11. Overload indication

Measured value ( dB )		Deviated Value ( dB )	Acceptance Limits ( dB )
Positive one-half cycle	Negative one-half cycle		
89.5	89.6	0.1	±1.5

### 12. High level stability

Frequency Weighting	SLM Display at initial ( dB )	SLM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	137.0	137.0	0.0	±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 —————

*T. Petcha-*



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Cert. No. : ACC24057  
Pages : 1 of 3

Calibration Certificate

Equipment : SOUND CALIBRATOR  
Manufacturer : RION  
Model : NC-74  
Serial No.: 34478386  
ID No.: SGK\_FS0011

REVIEW BY ..... *Supt S* .....  
APPROVED BY ..... *[Signature]* .....  
NEXT CAL DATE..... 22-Oct-25 .....

Condition As Found : GOOD

Customer : ALS LABORATORY GROUP (THAILAND) CO., LTD.  
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,  
KHWANG PHATTHANAKAN, KHET SUAN LUANG,  
BANGKOK, 10250 THAILAND.

Location : -  
Ambient Temperature : ( 23.0 ± 3 ) °C  
Pressure : ( 101.3 ± 3 ) kPa  
Relative Humidity : ( 50.0 ± 20 ) %

Received Date : 04 OCTOBER 2024  
Calibration Date : 22 OCTOBER 2024  
Date of Issue : 24 OCTOBER 2024

Calibrated by : Nathakorn Pisutpaisan

Approved by : *T. Petchurai*  
( Thanakul Petchurai )

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# SITHIPORN ASSOCIATES CO., LTD.

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Cert. No. : ACC24057

Job No. : VC67AC0167

Pages : 2 of 3

**Calibration Procedure :** CP-AC-03

### Calibration Method :

This equipment was calibrated by follow on IEC-60942-2003 Standard.

The sound pressure level, frequency and total distortion of the sound calibrator was measured using the reference microphone.

### Condition of this result of calibration :

#### 1. Reference Standard Instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL.BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL.BP 20/0267	15-FEB-25
Digital Multimeter	33461A	MY60024273	EEL.BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25
Audio Analyzer	AVR-3360A	V744B6069	EF-0009-24	09-FEB-25

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).

*T. Petch.*



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Cert. No. : ACC24057

Job No. : VC67AC0167

Pages : 3 of 3

### Result of calibration :

#### 1. Sound pressure level

Specified sound pressure level (dB)	Measured value (dB)	Deviated value (dB)	Uncertainty (dB)	Acceptance limit (dB)
94	94.14	0.14	0.14	0.40

#### 2. Frequency

Specified Frequency (Hz)	Measured value (Hz)	Deviated value ( % )	Uncertainty ( % )	Acceptance limit ( % )
1000	1002.6	0.3	0.1	1.0

#### 3. Total distortion

Measured value ( % )	Uncertainty ( % )	Acceptance limit ( % )
1.47	0.10	3.0

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

*T. Petcha-*

## Certificate of Calibration

### Customer

Name : ALS Laboratory Group Thailand Co., Ltd.  
Address : 104 Soi Phatthanakan 40, Phatthanakan Road, Suan Luang, Bangkok 10250

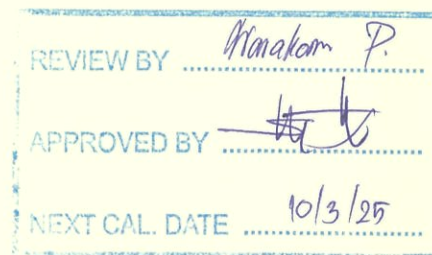
Certificate No : 24-SLM-100  
Request No : Req-2024-0430

### Unit Under Calibration Details

Measurement item : Sound Level Meter  
Manufacturer : RION  
Model : NL-52A  
Serial Number : 01120941  
ID : SGK\_FS0128  
Resolution : 0.1 dB  
Microphone Class : 1  
Microphone Model : UC-59  
Microphone S/N : 21943  
Preamplifier Model : NH-25  
Preamplifier S/N : 22330  
Instrument Status : Used

### Calibration Environment and Details

Temperature : 23 °C ± 2 °C  
Humidity : 50 %RH ± 20 %RH  
Barometric Pressure : 1013 hPa ± 10 hPa  
Received Date : 22 February 2024  
Calibrated Date : 11 March 2024




Calibration Procedure : In-house method CP-SLM-01 based on IEC 61672-3 : 2013 Electroacoustics - Sound level meters - Part 3: Periodic tests  
Location of Calibration : Lab Acoustic


### Reference Standard

Instrument	Brand	Model	SN.	Due calibration	Traceability
Standard Microphone	GRAS	40AN	188273	21 August 2024	GRAS
Multifrequency Calibrator	Quest	Quest-cal	EFA000234	26 July 2024	TSI
Audio Generator	Svantek	Svan401	131	9 October 2024	WK Electric

### Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor  $k = 2$ , providing a level of confidence approximately 95 %.

Calibrated By :   
Mr. Noppadon Luangart  
Service Calibration Engineer

Approved By :   
Mr. Pacit Mathavorn  
Calibration Engineer Supervisor

Issue Date : 11 March 2024

Certificate No : 24-SLM-100

Request No : Req-2024-0430

1. Indication at the calibration check frequency

UUC Setting	Nominal Level (dB)	Before Adjust		After Adjust		UNCERTAINTY ( ± dB)	Acceptance Limit ( ± dB)
FAST / A / 30-130		UUC (dB)	ERR (dB)	UUC (dB)	ERR (dB)		
Calibrator Setting							
1000 Hz 94 dB	113.78	113.8	+0.02	113.8	0.02	0.20	0.30

Note : Absolute sensitivity was established by the use of Sound Calibrator Brand SVANTEK, Model SV 35A, SN. 58079

2. Self-generated noise, Microphone installed

UUC Setting	Measured (dB)	UNCERTAINTY ( ± dB)
FAST / 30-130		
UUC Weighting		
A	14.9	0.10

3. Self-generated noise, Microphone replaced by the electrical input signal device

UUC Setting	Measured (dB)	UNCERTAINTY ( ± dB)
FAST / 30-130		
UUC Weighting		
A	11.4	0.10
C	14.8	0.10
Z	18.7	0.10

4. Acoustic signal test of frequency weightings (Without Windscreen)

UUC Setting	Deviation from various Frequency Weighting Responce curve			UNCERTAINTY	Acceptance Limit
FAST / 30-130	A	C	Z	( ± dB)	( ± dB)
STD Setting	(dB)	(dB)	(dB)		
125 Hz	0.1	0.2	0.2	0.60	1.0
1000 Hz	0.0	0.0	0.0	0.60	0.7
4000 Hz	-0.2	-0.2	-0.2	0.60	1.0
8000 Hz	-1.0	-1.0	-1.0	0.70	+1.5 -2.5



Certificate No : 24-SLM-100

Request No : Req-2024-0430

5. Electrical signal test of frequency weightings, Weighting network response with relative to 1 kHz

UUC Setting	Deviation from various Frequency			UNCERTAINTY  ( ± dB)	Acceptance
FAST / 30-130	Weighting Response curve				Limit
STD Setting	A (dB)	C (dB)	Z (dB)		( ± dB)
63 Hz	-0.2	-0.1	-0.1	0.20	1.0
125 Hz	-0.1	0.0	0.0		1.0
250 Hz	-0.1	0.0	0.0		1.0
500 Hz	0.0	0.0	0.0		1.0
1000 Hz	0.0	0.0	0.0		0.7
2000 Hz	0.0	0.0	0.0		1.0
4000 Hz	0.0	0.0	0.0		1.0
8000 Hz	0.1	0.1	0.0		+1.5, -2.5
16000 Hz	-1.3	-1.4	0.0		+2.5, -16.0

6. Frequency and time weightings at 1kHz

UUC Setting	STD	Measured		UNCERTAINTY  ( ± dB)	Acceptance  Limit  ( ± dB)
FAST / 30-130	REF	UUC	ERR		
UUC Weighting	(dB)	(dB)	(dB)		
A	114.00	114.0	0.0	0.20	0.20
C	114.00	114.0	0.0		0.20
Z	114.00	114.0	0.0		0.20

UUC Setting	STD	Measured		UNCERTAINTY  ( ± dB)	Acceptance  Limit  ( ± dB)
30-130 / A	REF	UUC	ERR		
UUC Time Response	(dB)	(dB)	(dB)		
Fast	114.00	114.0	0.0	0.20	0.10
Slow	114.00	114.0	0.0		0.10
Leq	114.00	114.0	0.0		0.10



Certificate No : 24-SLM-100

Request No : Req-2024-0430

7. Long Term Stability

UUC Setting	Measured	UNCERTAINTY  ( ± dB)	Acceptance
FAST / A / 30-130	UUC		Limit
STD Setting	(dB)		( ± dB)
Initial	114.0		
Final	114.0		
Deviated	0.0	0.10	0.10

8. Level linearity on the reference level range

UUC Setting	Anticipated	Deviation		UNCERTAINTY  ( ± dB)	Acceptance
FAST / A / 30-130	REF	UUC	ERR		Limit
STD dB	(dB)	(dB)	(dB)		( ± dB)
138.00	138	137.9	-0.1	0.30	0.8
134.00	134	134.0	0.0		0.8
129.00	129	128.9	-0.1		0.8
124.00	124	123.9	-0.1		0.8
119.00	119	119.0	0.0		0.8
114.00	114	114.0	0.0		0.8
109.00	109	109.0	0.0		0.8
104.00	104	104.0	0.0		0.8
99.00	99	99.0	0.0		0.8
94.00	94	94.0	0.0		0.8
89.00	89	89.0	0.0		0.8
84.00	84	84.0	0.0		0.8
79.00	79	79.0	0.0		0.8
74.00	74	74.0	0.0		0.8
69.00	69	69.0	0.0		0.8
64.00	64	64.0	0.0		0.8
59.00	59	59.0	0.0		0.8
54.00	54	54.0	0.0		0.8
49.00	49	49.0	0.0		0.8
44.00	44	44.0	0.0		0.8
39.00	39	39.0	0.0		0.8
34.00	34	34.0	0.0		0.8
29.00	29	28.9	-0.1		0.8
24.00	24	24.0	0.0		0.8



Certificate No : 24-SLM-100  
Request No : Req-2024-0430

9. Level linearity including the level range control

UUC Setting	STD	Measured		UNCERTAINTY	Acceptance
FAST / A	REF	UUC	ERR	( ± dB)	Limit
UUC Range	(dB)	(dB)	(dB)		( ± dB)
30-130	29.60	29.7	0.1	0.30	0.8
	114	114.0	0.0		0.8

10. Tone burst response

UUC Setting	STD	Anticipated	Measured		UNCERTAINTY	Acceptance
A / 30-130	Toneburst	Ref	UUC	ERR	( ± dB)	Limit
UUC Time Response	(ms)	(dB)	(dB)	(dB)		( ± dB)
Fast	200	126.0	126.0	0.0	0.20	0.5
	2	109.0	109.0	0.0		+1.0, -1.5
	0.25	100.0	99.9	-0.1		+1.0, -3.0
Slow	200	119.6	119.6	0.0		0.5
	2	100.0	100.0	0.0		+1.0, -3.0
SEL	200	120.0	120.0	0.0		0.5
	2	100.0	100.0	0.0		+1.0, -1.5
	0.25	91.0	90.9	-0.1		+1.0, -3.0

11. Peak C Sound level

UUC Setting	Anticipated	Measured		UNCERTAINTY	Acceptance
FAST / C / 55-141	REF	UUC	ERR	( ± dB)	Limit
STD Setting	(dB)	(dB)	(dB)		( ± dB)
Complete cycle	136.4	136.4	0.00	0.20	2.0
Positive half cycle	135.4	135.2	-0.20		1.0
Negative half cycle	135.4	135.2	-0.20		1.0

Certificate No : 24-SLM-100

Request No : Req-2024-0430

## 12. Overload indication

UUC Setting	Measured	UNCERTAINTY	Acceptance
FAST / A / 30-130	UUC		Limit
STD Setting	(dB)	( $\pm$ dB)	( $\pm$ dB)
Positive one-half cycle	139.4		
Negative one-half cycle	139.4		
Deviated	0.0	0.20	1.5

## 13. High Level Stability

UUC Setting	Measured	UNCERTAINTY	Acceptance
FAST / A / 30-130	UUC		Limit
STD Setting	(dB)	( $\pm$ dB)	( $\pm$ dB)
Initial	129.0		
Final	129.0		
Deviated	0.0	0.10	0.10

### Note :

Function	Maximum-permitted Uncertainty of measurement
1. Indication at the calibration check frequency	Not applicable
2. Self-generated noise, Microphone installed	Not applicable
3. Self-generated noise, Microphone replaced by the electrical input signal device	Not applicable
4. Acoustic signal test of frequency weightings at 10 Hz to 4 kHz	0.60 dB
4. Acoustic signal test of frequency weightings at >4 kHz to 10 kHz	0.70 dB
5. Electrical signal test of frequency weightings, Weighting network response with relative to 1 kHz	0.20 dB
6. Frequency and time weightings at 1kHz	0.20 dB
7. Long Term Stability	0.10 dB
8. Level linearity on the reference level range	0.30 dB
9. Level linearity including the level range control	0.30 dB
10. Tone burst response	0.30 dB
11. Peak C Sound level	0.35 dB
12. Overload indication	0.25 dB
13. High Level Stability	0.10 dB

- Acceptance limit and Maximum-permitted Uncertainty was IEC 61672-1:2013

### End of Certificate

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd

**Cert. No. : ACL24182**

**Pages : 1 of 8**

## Calibration Certificate

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-52A / Microphone UC-59 / Preamplifier NH-25  
**Serial No.:** 00331094 / 22922 / 22569  
**ID No.:** SGK\_FS0131

**Condition As Found :** GOOD

**Customer :** ALS LABORATORY GROUP (THAILAND) CO., LTD.  
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,  
KHWAEANG PHATTHANAKAN, KHET SUAN LUANG,  
BANGKOK, 10250 THAILAND.

**Location :** -  
**Ambient Temperature :** ( 23.0  $\pm$  3 ) °C  
**Pressure :** ( 101.3  $\pm$  3 ) kPa  
**Relative Humidity :** ( 50.0  $\pm$  20 ) %

**Received Date :** 06 JUNE 2024  
**Calibration Date :** 17 JUNE 2024  
**Date of Issue :** 18 JUNE 2024

REVIEW BY	Nathakorn P
APPROVED BY	[Signature]
NEXT CAL. DATE	17/6/25

**Calibrated by :** Nathakorn Pisutpaisan

**Approved by :** [Signature]  
( Thanakul Petchurai )

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.



# SITHIPORN ASSOCIATES CO., LTD.

## CALIBRATION LABORATORY

451-451/1 Sirinthorn Road, Bangbumru, Bangplud, Bangkok, 10700 Thailand  
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Cert. No. : ACL24182

Job No. : VC67AC0104

Pages : 2 of 8

Calibration Procedure : CP-AC-01

### Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).

The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments display and also with SLM's display.

### Condition of this result of calibration :

#### 1. Reference Standard Instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL.BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL.BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL.BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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).

*T. Petch.*

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### Summary of Measurement Result :

Parameter	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		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
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	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

*G. Petch.*



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### Result of calibration :

#### 1. Absolute sensitivity

Reference Acoustic Signal ( dB )	Measured Value ( dB )	Deviation ( dB )	Acceptance Limit ( dB )
93.9 (93.94)	94.0	0.0	±0.3

#### 2. Self-generated noise

##### 2.1 Normal test

Measured Value ( dB )
14.6

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

Frequency Weighting	Measured value ( dB )
A - weight	8.7
C - weight	14.6
Flat	20.3

#### 3. Acoustical signal tests of frequency weightings

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

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.2	0.2	0.2	± 1.0
1000	0.0	0.0	0.0	± 0.7
8000	-0.1	0.0	0.0	+ 1.5, - 2.5

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Job No. : VC67AC0104  
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#### 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	-0.1	0.0	±1.0
125	0.0	0.0	0.0	±1.0
250	0.0	0.0	0.0	±1.0
500	0.0	0.0	0.0	±1.0
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±1.0
4000	0.0	0.0	0.0	±1.0
8000	0.0	0.1	0.1	+ 1.5, - 2.5
16000	0.0	-1.2	-1.2	+ 2.5, -16.0

#### 5. Frequency and time weightings at 1 kHz

##### 5.1 Frequency weightings at 1 kHz

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

##### 5.2 Time weighting at 1 kHz

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

#### 6. Long - term stability

Frequency Weighting	SLM Display at initial ( dB )	SLM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	94.0	94.0	0.0	± 0.1

*G. Petch...*

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Job No. : VC67AC0104

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### 7. Level linearity on the reference level range

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
137.0	137.0	0.0	±0.8
136.0	136.0	0.0	±0.8
135.0	135.0	0.0	±0.8
134.0	134.0	0.0	±0.8
133.0	133.0	0.0	±0.8
132.0	132.0	0.0	±0.8
131.0	131.0	0.0	±0.8
129.0	129.0	0.0	±0.8
124.0	124.0	0.0	±0.8
119.0	119.0	0.0	±0.8
114.0	114.0	0.0	±0.8
109.0	109.0	0.0	±0.8
104.0	104.0	0.0	±0.8
99.0	99.0	0.0	±0.8
94.0	94.0	0.0	±0.8
89.0	89.0	0.0	±0.8
84.0	84.0	0.0	±0.8
79.0	79.0	0.0	±0.8
74.0	74.0	0.0	±0.8
69.0	69.0	0.0	±0.8
64.0	64.0	0.0	±0.8
59.0	59.0	0.0	±0.8
54.0	54.0	0.0	±0.8
49.0	49.0	0.0	±0.8
44.0	44.0	0.0	±0.8
39.0	39.0	0.0	±0.8
34.0	34.0	0.0	±0.8
30.0	30.0	0.0	±0.8
29.0	29.0	0.0	±0.8
28.0	28.0	0.0	±0.8
27.0	26.9	-0.1	±0.8
26.0	26.0	0.0	±0.8
25.0	24.9	-0.1	±0.8

*T. Ketch.*



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Job No. : VC67AC0104  
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### 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	±0.8

### 9. Tone burst response

Time Weighting	Tone burst duration, Tb ( ms )	Cycle	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Fast	0.25	1	108.0	107.9	-0.1	1.0 ; -3.0
	2	8	117.0	117.0	0.0	1.0 ; -1.5
	200	800	134.0	134.0	0.0	±0.5
Slow	2	8	108.0	108.0	0.0	1.0 ; -3.0
	200	800	127.6	127.6	0.0	±0.5
SEL	0.25	1	99.0	98.9	-0.1	1.0 ; -3.0
	2	8	108.0	108.0	0.0	1.0 ; -1.5
	200	800	128.0	128.0	0.0	±0.5

### 10. Peak C sound level

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value, Lcpeak ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	133.0	133.0	0.0	±2.0
One	136.4	135.5	-0.9	±2.0

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	±1.0
Positive half cycle	135.4	135.2	-0.2	±1.0
Negative half cycle	135.4	135.2	-0.2	±1.0

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Job No. : VC67AC0104  
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### 11. Overload indication

Measured value ( dB )		Deviated Value ( dB )	Acceptance Limits ( dB )
Positive one-half cycle	Negative one-half cycle		
89.6	89.6	0.0	±1.5

### 12. High level stability

Frequency Weighting	SLM Display at initial ( dB )	SLM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	137.0	137.0	0.0	±0.1

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** —————

*T. Petch.*



Cert. No. : ACL24183

Pages : 1 of 8

## Calibration Certificate

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-52A / Microphone UC-59 / Preamplifier NH-25  
**Serial No.:** 00331095 / 22927 / 22570  
**ID No.:** SGK\_FS0132

**Condition As Found :** GOOD

**Customer :** ALS LABORATORY GROUP (THAILAND) CO., LTD.  
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,  
KHWAEANG PHATTHANAKAN, KHET SUAN LUANG,  
BANGKOK, 10250 THAILAND.

**Location :** -  
**Ambient Temperature :** ( 23.0  $\pm$  3 ) °C  
**Pressure :** ( 101.3  $\pm$  3 ) kPa  
**Relative Humidity :** ( 50.0  $\pm$  20 ) %

**Received Date :** 06 JUNE 2024  
**Calibration Date :** 17 JUNE 2024  
**Date of Issue :** 18 JUNE 2024

REVIEW BY	Nathakorn P.
APPROVED BY	[Signature]
NEXT CAL. DATE	17/6/25

**Calibrated by :** Nathakorn Pisutpaisan

**Approved by :** T. Petchur.  
( Thanakul Petchurai )

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.

# SITHIPORN ASSOCIATES CO., LTD.

## CALIBRATION LABORATORY

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Tel. +66 2433 8331 Email : calibration@sithiporn.com

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**Cert. No. : ACL24183**

**Job No. : VC67AC0104**

**Pages : 2 of 8**

**Calibration Procedure :** CP-AC-01

### Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).

The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments display and also with SLM's display.

### Condition of this result of calibration :

#### 1. Reference Standard Instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL.BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL.BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL.BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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).

# SITHIPORN ASSOCIATES CO., LTD.

## CALIBRATION LABORATORY

451-451/1 Sirinthorn Road, Bangbunru, Bangplud, Bangkok, 10700 Thailand  
Tel. +66 2433 8331 Email : calibration@sithiporn.com

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Cert. No. : ACL24183

Job No. : VC67AC0104

Pages : 3 of 8

### Summary of Measurement Result :

Parameter	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		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
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	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

*T. Ketch.*



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### Result of calibration :

#### 1. Absolute sensitivity

Reference Acoustic Signal ( dB )	Measured Value ( dB )	Deviation ( dB )	Acceptance Limit ( dB )
93.9 (93.94)	94.0	0.0	±0.3

#### 2. Self-generated noise

##### 2.1 Normal test

Measured Value ( dB )
14.1

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

Frequency Weighting	Measured value ( dB )
A - weight	8.7
C - weight	14.2
Flat	19.9

#### 3. Acoustical signal tests of frequency weightings

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

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.2	0.2	0.2	± 1.0
1000	0.0	0.0	0.0	± 0.7
8000	0.6	0.7	0.6	+ 1.5, - 2.5

*G. Petch*

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Job No. : VC67AC0104  
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#### 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	0.0	0.0	±1.0
125	0.0	0.0	0.0	±1.0
250	0.0	0.0	0.0	±1.0
500	0.0	0.0	0.0	±1.0
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±1.0
4000	0.0	0.0	0.0	±1.0
8000	0.0	0.1	0.1	+ 1.5, - 2.5
16000	0.0	-1.2	-1.2	+ 2.5, -16.0

#### 5. Frequency and time weightings at 1 kHz

##### 5.1 Frequency weightings at 1 kHz

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

##### 5.2 Time weighting at 1 kHz

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

#### 6. Long - term stability

Frequency Weighting	SLM Display at initial ( dB )	SLM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	94.0	94.0	0.0	± 0.1

*T. Ketchum*



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Cert. No. : ACL24183

Job No. : VC67AC0104

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### 7. Level linearity on the reference level range

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
137.0	137.0	0.0	±0.8
136.0	136.0	0.0	±0.8
135.0	135.0	0.0	±0.8
134.0	134.0	0.0	±0.8
133.0	133.0	0.0	±0.8
132.0	132.0	0.0	±0.8
131.0	131.0	0.0	±0.8
129.0	129.0	0.0	±0.8
124.0	124.0	0.0	±0.8
119.0	119.0	0.0	±0.8
114.0	114.0	0.0	±0.8
109.0	109.0	0.0	±0.8
104.0	104.0	0.0	±0.8
99.0	99.0	0.0	±0.8
94.0	94.0	0.0	±0.8
89.0	89.0	0.0	±0.8
84.0	84.0	0.0	±0.8
79.0	79.0	0.0	±0.8
74.0	74.0	0.0	±0.8
69.0	69.0	0.0	±0.8
64.0	64.0	0.0	±0.8
59.0	59.0	0.0	±0.8
54.0	53.9	-0.1	±0.8
49.0	49.0	0.0	±0.8
44.0	43.9	-0.1	±0.8
39.0	39.0	0.0	±0.8
34.0	34.0	0.0	±0.8
30.0	29.9	-0.1	±0.8
29.0	28.9	-0.1	±0.8
28.0	27.9	-0.1	±0.8
27.0	26.9	-0.1	±0.8
26.0	25.9	-0.1	±0.8
25.0	24.9	-0.1	±0.8

*G. Ketch.*

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Job No. : VC67AC0104  
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### 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	±0.8

### 9. Tone burst response

Time Weighting	Tone burst duration, Tb ( ms )	Cycle	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Fast	0.25	1	108.0	107.9	-0.1	1.0 ; -3.0
	2	8	117.0	117.0	0.0	1.0 ; -1.5
	200	800	134.0	134.1	0.1	±0.5
Slow	2	8	108.0	108.0	0.0	1.0 ; -3.0
	200	800	127.6	127.6	0.0	±0.5
SEL	0.25	1	99.0	98.9	-0.1	1.0 ; -3.0
	2	8	108.0	108.0	0.0	1.0 ; -1.5
	200	800	128.0	128.1	0.1	±0.5

### 10. Peak C sound level

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value, Lcpeak ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	133.0	133.0	0.0	±2.0
One	136.4	135.8	-0.6	±2.0

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	±1.0
Positive half cycle	135.4	135.2	-0.2	±1.0
Negative half cycle	135.4	135.2	-0.2	±1.0

*T. Petchum*

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### 11. Overload indication

Measured value ( dB )		Deviated Value ( dB )	Acceptance Limits ( dB )
Positive one-half cycle	Negative one-half cycle		
89.5	89.6	0.1	±1.5

### 12. High level stability

Frequency Weighting	SLM Display at initial ( dB )	SLM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	137.0	137.0	0.0	±0.1

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 —————

*T. Petch...*



**Cert. No. : ACL24185**

**Pages : 1 of 8**

## Calibration Certificate

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-52A / Microphone UC-59 / Preamplifier NH-25  
**Serial No.:** 00331097 / 22940 / 22572  
**ID No.:** SGK\_FS0134

**Condition As Found :** GOOD

**Customer :** ALS LABORATORY GROUP (THAILAND) CO., LTD.  
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,  
KHWANG PHATTHANAKAN, KHET SUAN LUANG,  
BANGKOK, 10250 THAILAND.

**Location :** -  
**Ambient Temperature :** ( 23.0  $\pm$  3 ) °C  
**Pressure :** ( 101.3  $\pm$  3 ) kPa  
**Relative Humidity :** ( 50.0  $\pm$  20 ) %

**Received Date :** 06 JUNE 2024  
**Calibration Date :** 17 JUNE 2024  
**Date of Issue :** 18 JUNE 2024



**Calibrated by :** Nathakorn Pisutpaisan

**Approved by :** *[Signature]*  
( Thanakul Petchurai )

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Cert. No. : ACL24185

Job No. : VC67AC0104

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Calibration Procedure : CP-AC-01

### Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).

The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments display and also with SLM's display.

### Condition of this result of calibration :

#### 1. Reference Standard Instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL.BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL.BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL.BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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).

*G. Peter.*

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Cert. No. : ACL24185

Job No. : VC67AC0104

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### Summary of Measurement Result :

Parameter	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		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
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	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

*Z. Petcha*

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### Result of calibration :

#### 1. Absolute sensitivity

Reference Acoustic Signal ( dB )	Measured Value ( dB )	Deviation ( dB )	Acceptance Limit ( dB )
93.9 (93.94)	94.0	0.0	±0.3

#### 2. Self-generated noise

##### 2.1 Normal test

Measured Value ( dB )
14.4

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

Frequency Weighting	Measured value ( dB )
A - weight	9.9
C - weight	15.1
Flat	20.9

#### 3. Acoustical signal tests of frequency weightings

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

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.2	0.3	0.3	± 1.0
1000	0.1	0.1	0.1	± 0.7
8000	0.4	0.5	0.5	+ 1.5, - 2.5

*G. Petch*



**Cert. No. : ACL24185**

**Job No. : VC67AC0104**

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#### 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
63	0.0	-0.1	0.0	±1.0
125	0.0	0.0	0.0	±1.0
250	0.0	0.0	-0.1	±1.0
500	0.0	0.0	-0.1	±1.0
1000	0.0	0.0	0.0	±1.0
2000	0.0	0.0	0.0	±1.0
4000	0.0	0.0	0.0	±1.0
8000	0.0	0.0	0.0	+ 1.5, - 2.5
16000	0.0	-1.2	-1.2	+ 2.5, -16.0

#### 5. Frequency and time weightings at 1 kHz

##### 5.1 Frequency weightings at 1 kHz

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

##### 5.2 Time weighting at 1 kHz

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

#### 6. Long - term stability

Frequency Weighting	SLM Display at initial ( dB )	SLM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	94.0	94.0	0.0	± 0.1

*T. Petch*



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Job No. : VC67AC0104

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### 7. Level linearity on the reference level range

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
137.0	137.1	0.1	±0.8
136.0	136.1	0.1	±0.8
135.0	135.1	0.1	±0.8
134.0	134.1	0.1	±0.8
133.0	133.1	0.1	±0.8
132.0	132.1	0.1	±0.8
131.0	131.0	0.0	±0.8
129.0	129.1	0.1	±0.8
124.0	124.0	0.0	±0.8
119.0	119.1	0.1	±0.8
114.0	114.1	0.1	±0.8
109.0	109.1	0.1	±0.8
104.0	104.1	0.1	±0.8
99.0	99.1	0.1	±0.8
94.0	94.0	0.0	±0.8
89.0	89.0	0.0	±0.8
84.0	84.0	0.0	±0.8
79.0	79.0	0.0	±0.8
74.0	74.0	0.0	±0.8
69.0	69.0	0.0	±0.8
64.0	64.0	0.0	±0.8
59.0	59.0	0.0	±0.8
54.0	54.0	0.0	±0.8
49.0	49.0	0.0	±0.8
44.0	44.0	0.0	±0.8
39.0	39.0	0.0	±0.8
34.0	34.0	0.0	±0.8
30.0	30.0	0.0	±0.8
29.0	28.9	-0.1	±0.8
28.0	28.0	0.0	±0.8
27.0	27.0	0.0	±0.8
26.0	26.0	0.0	±0.8
25.0	25.0	0.0	±0.8

*T. Petch.*

**Cert. No. : ACL24185**  
**Job No. : VC67AC0104**  
**Pages : 7 of 8**

**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	±0.8

**9. Tone burst response**

Time Weighting	Tone burst duration, Tb ( ms )	Cycle	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Fast	0.25	1	108.0	107.9	-0.1	1.0 ; -3.0
	2	8	117.0	117.0	0.0	1.0 ; -1.5
	200	800	134.0	134.0	0.0	±0.5
Slow	2	8	108.0	108.0	0.0	1.0 ; -3.0
	200	800	127.6	127.6	0.0	±0.5
SEL	0.25	1	99.0	98.9	-0.1	1.0 ; -3.0
	2	8	108.0	108.0	0.0	1.0 ; -1.5
	200	800	128.0	128.0	0.0	±0.5

**10. Peak C sound level**

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value, Lcpeak ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	133.0	133.0	0.0	±2.0
One	136.4	136.1	-0.3	±2.0

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	±1.0
Positive half cycle	135.4	135.2	-0.2	±1.0
Negative half cycle	135.4	135.2	-0.2	±1.0

*G. Petch.*

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### 11. Overload indication

Measured value ( dB )		Deviated Value ( dB )	Acceptance Limits ( dB )
Positive one-half cycle	Negative one-half cycle		
89.6	89.5	-0.1	±1.5

### 12. High level stability

Frequency Weighting	SLM Display at initial ( dB )	SLM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	137.0	137.0	0.0	±0.1

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** —————

*F. Petch.*



**Cert. No. : ACL24302**

**Pages : 1 of 8**

## Calibration Certificate

**Equipment :** SOUND LEVEL METER  
**Manufacturer :** RION  
**Model :** NL-42 / Microphone UC-52 / Preamplifier NH-24  
**Serial No.:** 00472131 / 171451 / 73493  
**ID No.:** SGK\_FS0015

**Condition As Found :** GOOD

**Customer :** ALS LABORATORY GROUP (THAILAND) CO., LTD.  
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,  
KHWANG PHATTHANAKAN, KHET SUAN LUANG,  
BANGKOK, 10250 THAILAND.

**Location :** -  
**Ambient Temperature :** ( 23.0  $\pm$  3 ) °C  
**Pressure :** ( 101.3  $\pm$  3 ) kPa  
**Relative Humidity :** ( 50.0  $\pm$  20 ) %

**Received Date :** 11 SEPTEMBER 2024  
**Calibration Date :** 01-02 OCTOBER 2024  
**Date of Issue :** 02 OCTOBER 2024



**Calibrated by :**

Nathakorn Pisutpaisan

**Approved by :**

(  )  
( Thanakul Petchurai )

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Cert. No. : ACL24302  
Job No. : VC67AC0157  
Pages : 2 of 8

Calibration Procedure : CP-AC-01

### Calibration Method :

This equipment was calibrated by follow on IEC-61672-3 (2013) Standard for sound level meter (SLM).

The SLM had tests to Acoustical and Electrical signal tests of frequency weighting with Anechoic chamber and Reference Standard Instruments.

For tests results of each items were made by observation of each Instruments display and also with SLM's display.

### Condition of this result of calibration :

#### 1. Reference Standard Instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
Waveform Generator	33210A	MY48017076	EF-0009-24	05-FEB-25
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL.BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL.BP 20/0267	15-FEB-25
Digital Multimeter	34461A	MY60024273	EEL.BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25

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).

A handwritten signature in blue ink, likely of the person responsible for the calibration, is located at the bottom right of the page.

# SITHIPORN ASSOCIATES CO., LTD.

## CALIBRATION LABORATORY

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Tel. +66 2433 8331 Email : calibration@sithiporn.com

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Cert. No. : ACL24302

Job No. : VC67AC0157

Pages : 3 of 8

### Summary of Measurement Result :

Parameter	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		
125 Hz	0.3	0.6
1000 Hz	0.3	0.6
8000 Hz	0.3	0.7
4. Electrical signal tests of frequency weightings		
For 10 Hz to 4 kHz	0.3	0.6
For > 4 kHz to 10 kHz	0.3	0.7
For > 10 kHz to 20 kHz	0.3	1.0
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	0.35
11. Overload indication	0.2	0.25
12. High level stability	0.1	0.1

*T. Petch*

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Cert. No. : ACL24302  
Job No. : VC67AC0157  
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### Result of calibration :

#### 1. Absolute sensitivity

Reference Acoustic Signal ( dB )	Measured Value ( dB )	Deviation ( dB )	Acceptance Limit ( dB )
93.9 (93.94)	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	Weighting ( dB )
A - weight	12.0
C - weight	18.0
Flat	23.9

#### 3. Acoustical signal tests of frequency weightings

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

Frequency ( Hz )	Deviation from various frequency weighting response curve (dB)			
	Flat	C-weight	A-weight	Acceptance Limits
125	0.0	0.0	0.1	± 1.5
1000	-0.2	-0.2	-0.1	± 1.0
8000	-0.5	-0.4	-0.4	±5.0

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#### 4. Electrical signal tests of frequency weightings

Weighting network response with relative to 1 kHz.

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

#### 5. Frequency and time weightings at 1 kHz

##### 5.1 Frequency weightings at 1 kHz

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

##### 5.2 Time weighting at 1 kHz

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

#### 6. Long - term stability

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

*T. Lech.*



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Job No. : VC67AC0157  
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### 7. Level linearity on the reference level range

Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
137.0	137.0	0.0	$\pm 1.1$
136.0	136.0	0.0	$\pm 1.1$
135.0	135.0	0.0	$\pm 1.1$
134.0	134.0	0.0	$\pm 1.1$
133.0	133.0	0.0	$\pm 1.1$
132.0	132.0	0.0	$\pm 1.1$
131.0	131.0	0.0	$\pm 1.1$
129.0	129.0	0.0	$\pm 1.1$
124.0	124.0	0.0	$\pm 1.1$
119.0	119.0	0.0	$\pm 1.1$
114.0	114.0	0.0	$\pm 1.1$
109.0	109.0	0.0	$\pm 1.1$
104.0	104.0	0.0	$\pm 1.1$
99.0	99.0	0.0	$\pm 1.1$
94.0	94.0	0.0	$\pm 1.1$
89.0	89.0	0.0	$\pm 1.1$
84.0	84.0	0.0	$\pm 1.1$
79.0	79.0	0.0	$\pm 1.1$
74.0	74.1	0.1	$\pm 1.1$
69.0	69.1	0.1	$\pm 1.1$
64.0	64.0	0.0	$\pm 1.1$
59.0	59.1	0.1	$\pm 1.1$
54.0	54.1	0.1	$\pm 1.1$
49.0	49.0	0.0	$\pm 1.1$
44.0	44.0	0.0	$\pm 1.1$
39.0	39.0	0.0	$\pm 1.1$
34.0	34.1	0.1	$\pm 1.1$
30.0	30.3	0.3	$\pm 1.1$
29.0	29.3	0.3	$\pm 1.1$
28.0	28.4	0.4	$\pm 1.1$
27.0	27.4	0.4	$\pm 1.1$
26.0	26.6	0.6	$\pm 1.1$
25.0	25.7	0.7	$\pm 1.1$

*J. Keteh...*

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### 8. Level linearity including the level range control

Range	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
130	94.0	94.0	0.0	±1.1

Range	Anticipated Value ( dB )	Measured Value ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
130	30.0	30.2	0.2	±1.1

### 9. Tone burst response

Time Weighting	Tone burst duration, Tb ( 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	117.0	0.0	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
SEL	0.25	1	99.0	98.9	-0.1	1.5 ; -5.0
	2	8	108.0	108.0	0.0	1.0 ; -2.5
	200	800	128.0	128.1	0.1	±1.0

*J. Petch*

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Job No. : VC67AC0157  
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### 10. Peak C sound level

Number of cycle in test signal	Anticipated Value ( dB )	Measured Value, L <sub>cpeak</sub> ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
Continuous	133.0	133.0	0.0	±3.0
One	136.4	135.6	-0.8	±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	±2.0
Positive half cycle	135.4	135.1	-0.3	±2.0
Negative half cycle	135.4	135.2	-0.2	±2.0

### 11. Overload indication

Measured value ( dB )		Deviated Value ( dB )	Acceptance Limits ( dB )
Positive one-half cycle	Negative one-half cycle		
89.7	89.5	-0.2	±1.5

### 12. High level stability

Frequency Weighting	SLM Display at initial ( dB )	SLM Display at final ( dB )	Deviated Value ( dB )	Acceptance Limits ( dB )
A - weight	137.0	137.0	0.0	±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



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**Cert. No. : ACC24073**

**Pages : 1 of 3**

## Calibration Certificate

**Equipment :** SOUND CALIBRATOR  
**Manufacturer :** RION  
**Model :** NC-75  
**Serial No.:** 35024429  
**ID No.:** SGK\_FS0114

**Condition As Found :** GOOD

**Customer :** ALS LABORATORY GROUP (THAILAND) CO., LTD.  
104 PHATTHANAKAN 40, PHATTHANAKAN ROAD,  
KHWANG PHATTHANAKAN, KHET SUAN LUANG,  
BANGKOK, 10250 THAILAND.


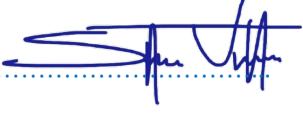
**Location :** -  
**Ambient Temperature :** ( 23.0  $\pm$  3 ) °C  
**Pressure :** ( 101.3  $\pm$  3 ) kPa  
**Relative Humidity :** ( 50.0  $\pm$  20 ) %

**Received Date :** 26 NOVEMBER 2024  
**Calibration Date :** 11 DECEMBER 2024  
**Date of Issue :** 11 DECEMBER 2024

**Calibrated by :** Nathakorn Pisutpaisan

**Approved by :**

  
( Thanakul Petchurai )

REVIEW BY .....	
APPROVED BY .....	
NEXT CAL DATE.....	11 /12 /25

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.



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**Cert. No. : ACC24073**

**Job No. : VC67AC0167**

**Pages : 2 of 3**

**Calibration Procedure : CP-AC-03**

### Calibration Method :

This equipment was calibrated by follow on IEC-60942-2003 Standard.

The sound pressure level, frequency and total distortion of the sound calibrator was measured using the reference microphone.

### Condition of this result of calibration :

#### 1. Reference Standard Instruments :

<u>Instrument</u>	<u>Model</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
Waveform Generator	33511B	MY52302742	EF-0007-24	05-FEB-25
Digital Multimeter	33461A	MY53220104	EEL.BP 21/0267	13-FEB-25
Digital Multimeter	33461A	MY53220076	EEL.BP 20/0267	15-FEB-25
Digital Multimeter	33461A	MY60024273	EEL.BP 22/0267	15-FEB-25
Programmable Attenuator	MAT-1070	62100114	EF-0008-24	05-FEB-25
Condenser Microphone	4180	2977900	AA-1001-24	12-FEB-25
Measuring Amplifier	NA-42KAI	34560495	AA-3001-24	05-FEB-25
Audio Analyzer	AVR-3360A	V744B6069	EF-0009-24	09-FEB-25

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).

*T. Petchu*

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Cert. No. : ACC24073  
Job No. : VC67AC0167  
Pages : 3 of 3

### Result of calibration :

#### 1. Sound pressure level

Specified sound pressure level (dB)	Measured value (dB)	Deviated value (dB)	Uncertainty (dB)	Acceptance limit (dB)
94	93.97	-0.03	0.14	0.40

#### 2. Frequency

Specified Frequency (Hz)	Measured value (Hz)	Deviated value ( % )	Uncertainty ( % )	Acceptance limit ( % )
1000	1000.0	0.0	0.1	1.0

#### 3. Total distortion

Measured value ( % )	Uncertainty ( % )	Acceptance limit ( % )
0.15	0.10	3.0

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 —————

*G. Petch*



Certificate of Calibration

Customer

Name : ALS Laboratory Group Thailand Co., Ltd.  
Address : 104 Soi Phatthanakan 40, Phatthanakan Road, Suan Luang, Bangkok 10250

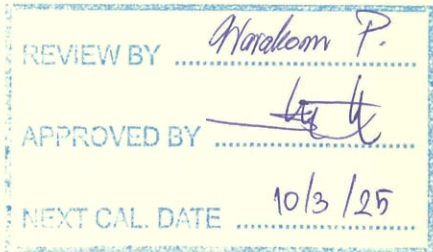
Certificate No : 24-SLM-099  
Request No : Req-2024-0429

Unit Under Calibration Details

Measurement item : Sound Level Meter  
Manufacturer : RION  
Model : NL-52A  
Serial Number : 01120942  
ID : SGK\_FS0129  
Resolution : 0.1 dB  
Microphone Class : 1  
Microphone Model : UC-59  
Microphone S/N : 21945  
Preamplifier Model : NH-25  
Preamplifier S/N : 22331  
Instrument Status : Used

Calibration Environment and Details

Temperature : 23 °C ± 2 °C  
Humidity : 50 %RH ± 20 %RH  
Barometric Pressure : 1013 hPa ± 10 hPa  
Received Date : 22 February 2024  
Calibrated Date : 11 March 2024  
Calibration Procedure : In-house method CP-SLM-01 based on IEC 61672-3 : 2013 Electroacoustics - Sound level meters - Part 3: Periodic tests  
Location of Calibration : Lab Acoustic



Reference Standard

Instrument	Brand	Model	SN.	Due calibration	Traceability
Standard Microphone	GRAS	40AN	188273	21 August 2024	GRAS
Multifrequency Calibrator	Quest	Quest-cal	EFA000234	26 July 2024	TSI
Audio Generator	Svantek	Svan401	131	9 October 2024	WK Electric

Note

The reported uncertainty is based on standard uncertainty multiplied by the Coverage Factor  $k = 2$ , providing a level of confidence approximately 95 %.

Calibrated By : me  
Mr. Noppadon Luangart  
Service Calibration Engineer

Approved By : anm  
Mr. Pacit Mathavorn  
Calibration Engineer Supervisor

Issue Date : 11 March 2024



Certificate No : 24-SLM-099

Request No : Req-2024-0429

1. Indication at the calibration check frequency

UUC Setting	Nominal Level (dB)	Before Adjust		After Adjust		UNCERTAINTY ( ± dB)	Acceptance Limit ( ± dB)
FAST / A / 30-130		UUC	ERR	UUC	ERR		
Calibrator Setting		(dB)	(dB)	(dB)	(dB)		
1000 Hz 94 dB	113.78	113.6	-0.18	113.8	0.02	0.20	0.30

Note : Absolute sensitivity was established by the use of Sound Calibrator Brand SVANTEK, Model SV 35A, SN. 58079

2. Self-generated noise, Microphone installed

UUC Setting	Measured (dB)	UNCERTAINTY ( ± dB)
FAST / 30-130		
UUC Weighting		
A	17.4	0.10

3. Self-generated noise, Microphone replaced by the electrical input signal device

UUC Setting	Measured (dB)	UNCERTAINTY ( ± dB)
FAST / 30-130		
UUC Weighting		
A	11.3	0.10
C	15.1	0.10
Z	18.6	0.10

4. Acoustic signal test of frequency weightings (Without Windscreen)

UUC Setting	Deviation from various Frequency Weighting Responce curve			UNCERTAINTY	Acceptance Limit
FAST / 30-130	A	C	Z	( ± dB)	( ± dB)
STD Setting	(dB)	(dB)	(dB)		
125 Hz	0.1	0.2	0.2	0.60	1.0
1000 Hz	0.0	0.0	0.0	0.60	0.7
4000 Hz	-0.1	-0.1	-0.1	0.60	1.0
8000 Hz	-0.8	-0.8	-0.8	0.70	+1.5 -2.5



Certificate No : 24-SLM-099

Request No : Req-2024-0429

5. Electrical signal test of frequency weightings, Weighting network response with relative to 1 kHz

UUC Setting	Deviation from various Frequency			UNCERTAINTY	Acceptance
FAST / 30-130	Weighting Response curve				Limit
STD Setting	A (dB)	C (dB)	Z (dB)	( ± dB)	( ± dB)
63 Hz	-0.3	-0.1	-0.1	0.20	1.0
125 Hz	-0.2	0.0	-0.1		1.0
250 Hz	-0.1	0.0	0.0		1.0
500 Hz	-0.1	0.0	0.0		1.0
1000 Hz	0.0	0.0	0.0		0.7
2000 Hz	0.0	0.0	0.0		1.0
4000 Hz	0.0	0.0	0.0		1.0
8000 Hz	0.0	0.0	0.0		+1.5, -2.5
16000 Hz	-1.4	-1.4	0.0		+2.5, -16.0

6. Frequency and time weightings at 1kHz

UUC Setting	STD	Measured		UNCERTAINTY ( ± dB)	Acceptance Limit ( ± dB)
FAST / 30-130	REF	UUC	ERR		
UUC Weighting	(dB)	(dB)	(dB)		
A	114.00	114.0	0.0	0.20	0.20
C	114.00	114.0	0.0		0.20
Z	114.00	114.0	0.0		0.20

UUC Setting	STD	Measured		UNCERTAINTY ( ± dB)	Acceptance Limit ( ± dB)
30-130 / A	REF	UUC	ERR		
UUC Time Response	(dB)	(dB)	(dB)		
Fast	114.00	114.0	0.0	0.20	0.10
Slow	114.00	114.0	0.0		0.10
Leq	114.00	114.0	0.0		0.10

Certificate No : 24-SLM-099  
Request No : Req-2024-0429

7. Long Term Stability

UUC Setting	Measured	UNCERTAINTY  ( ± dB)	Acceptance
FAST / A / 30-130	UUC		Limit
STD Setting	(dB)		( ± dB)
Initial	114.0		
Final	114.0		
Deviated	0.0	0.10	0.10

8. Level linearity on the reference level range

UUC Setting	Anticipated	Deviation		UNCERTAINTY  ( ± dB)	Acceptance Limit
FAST / A / 30-130	REF	UUC	ERR		Limit
STD dB	(dB)	(dB)	(dB)		( ± dB)
138.00	138	138.0	0.0	0.30	0.8
134.00	134	134.0	0.0		0.8
129.00	129	129.0	0.0		0.8
124.00	124	124.0	0.0		0.8
119.00	119	119.0	0.0		0.8
114.00	114	114.0	0.0		0.8
109.00	109	109.0	0.0		0.8
104.00	104	104.0	0.0		0.8
99.00	99	99.0	0.0		0.8
94.00	94	94.0	0.0		0.8
89.00	89	89.0	0.0		0.8
84.00	84	84.0	0.0		0.8
79.00	79	79.0	0.0		0.8
74.00	74	74.0	0.0		0.8
69.00	69	69.0	0.0		0.8
64.00	64	64.0	0.0		0.8
59.00	59	59.0	0.0		0.8
54.00	54	54.0	0.0		0.8
49.00	49	49.0	0.0		0.8
44.00	44	44.0	0.0		0.8
39.00	39	39.0	0.0		0.8
34.00	34	34.0	0.0		0.8
29.00	29	29.0	0.0		0.8
24.00	24	24.1	0.1		0.8

Certificate No : 24-SLM-099  
Request No : Req-2024-0429

9. Level linearity including the level range control

UUC Setting	STD	Measured		UNCERTAINTY	Acceptance
FAST / A	REF	UUC	ERR	( ± dB)	Limit
UUC Range	(dB)	(dB)	(dB)		( ± dB)
30-130	29.60	29.7	0.1		0.8
	114	114.0	0.0	0.30	0.8

10. Tone burst response

UUC Setting	STD	Anticipated	Measured		UNCERTAINTY	Acceptance
A / 30-130	Toneburst	Ref	UUC	ERR	( ± dB)	Limit
UUC Time Responce	(ms)	(dB)	(dB)	(dB)		( ± dB)
Fast	200	126.0	126.0	0.0	0.20	0.5
	2	109.0	108.9	-0.1		+1.0, -1.5
	0.25	100.0	99.8	-0.2		+1.0, -3.0
Slow	200	119.6	119.5	-0.1		0.5
	2	100.0	99.9	-0.1		+1.0, -3.0
SEL	200	120.0	120.0	0.0		0.5
	2	100.0	100.0	0.0		+1.0, -1.5
	0.25	91.0	90.8	-0.2		+1.0, -3.0

11. Peak C Sound level

UUC Setting	Anticipated	Measured		UNCERTAINTY	Acceptance
FAST / C / 55-141	REF	UUC	ERR	( ± dB)	Limit
STD Setting	(dB)	(dB)	(dB)		( ± dB)
Complete cycle	136.4	136.2	-0.20	0.20	2.0
Positive half cycle	135.4	135.1	-0.30		1.0
Negative half cycle	135.4	135.1	-0.30		1.0



Certificate No : 24-SLM-099

Request No : Req-2024-0429

## 12. Overload indication

UUC Setting	Measured	UNCERTAINTY	Acceptance
FAST / A / 30-130	UUC		Limit
STD Setting	(dB)	( ± dB)	( ± dB)
Positive one-half cycle	139.7		
Negative one-half cycle	139.6		
Deviated	0.1	0.20	1.5

## 13. High Level Stability

UUC Setting	Measured	UNCERTAINTY	Acceptance
FAST / A / 30-130	UUC		Limit
STD Setting	(dB)	( ± dB)	( ± dB)
Initial	129.0		
Final	129.0		
Deviated	0.0	0.10	0.10

### Note :

Function	Maximum-permitted Uncertainty of measurement
1. Indication at the calibration check frequency	Not applicable
2. Self-generated noise, Microphone installed	Not applicable
3. Self-generated noise, Microphone replaced by the electrical input signal device	Not applicable
4. Acoustic signal test of frequency weightings at 10 Hz to 4 kHz	0.60 dB
4. Acoustic signal test of frequency weightings at >4 kHz to 10 kHz	0.70 dB
5. Electrical signal test of frequency weightings, Weighting network response with relative to 1 kHz	0.20 dB
6. Frequency and time weightings at 1kHz	0.20 dB
7. Long Term Stability	0.10 dB
8. Level linearity on the reference level range	0.30 dB
9. Level linearity including the level range control	0.30 dB
10. Tone burst response	0.30 dB
11. Peak C Sound level	0.35 dB
12. Overload indication	0.25 dB
13. High Level Stability	0.10 dB

- Acceptance limit and Maximum-permitted Uncertainty was IEC 61672-1:2013

### End of Certificate

The results related only to the item calibrated. The certificate shall not be reproduced except in full, without written approval of the Innovative Instrument Co., Ltd





TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
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TEL. 0-2717-3000-24 FAX. 0-2719-9484



## Certificate of Calibration

Certificate No. : 24PH439

Page : 1 of 2

Equipment : Lux Meter  
Manufacturer: Delta OHM  
Model : HD 2102.2  
Serial No.: 17020596  
ID No.: SGK\_FS0020  
Condition As-Received: Used Item  
Received Date: 19 August 2024  
Calibration Date: 26 August 2024  
Reference: 2408-0589WSC  
Ambient Temperature: ( 23 ± 2 ) °C  
Relative Humidity: ( 50 ± 15 ) %

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

Submitted by: ALS Laboratory Group (Thailand) Co.,Ltd.

104 Phatthanakan 40, Phatthanakan Rd.,  
Khwaeng Phatthanakan, Khet Suan Luang,  
Bangkok 10250 Thailand

Procedure used: Calibration were conducted using calibration procedure No. CP-PH01 based on inverse square law technique.

### Condition of this result of calibration

1.Reference standards instruments :

Instrument	Model	Serial No.	Certificate No.	Due Date
1) Photometry & Encorder	LMguide 9,6 m	120RC003	DL-0064-22	20 Jul 2025
2) High-accuracy Irradiance Standard	OL-FEL-U	F-1471	TP-1048-23	01 Oct 2024

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

3.Test Equipment : Programmable Voltage/Current Source ( Model : OL83A, S/N : 09220284 ).

4.Test Equipment : Illuminance Meter ( Model : 51002, S/N : 080129 ).

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

6.This Certification is traceable to the International System of Unit maintained through:-

-National Institute of Metrology Thailand (NIMT)

REVIEW BY	<i>Norikorn P.</i>
APPROVED BY	<i>[Signature]</i>
NEXT CAL. DATE	26/8/25

Calibrated by : Nivat Nitas  
Issue Date : 27 August 2024

Approved Signatory : *Norikorn P.*

- [ ] Phalinee Prabpaipal  
[ ] Chatchawan Khunpiluek  
[✓] Nuntawat Khamchai



Cert. No.: 24PH439

Page.: 2 of 2

**Result of calibration:-** ( \* ) Without adjustment ( ) After adjustment

**Function :** Illuminance Measurement

**Range :** Autorange

<u>Standard Value</u>	<u>UUC* Reading</u>	<u>Error</u>	<u>Uncertainty</u>
( lx )	( lx )	( lx )	( ± lx )
0	0.00	0.00	-
15	14.33	-0.67	0.22
100	95.14	-4.86	1.5
500	483.6	-16.4	7.1
1000	979.2	-20.8	15
2000	1994.3	-5.7	29
3000	3033	33	43
4000	4099	99	58
5000	5164	164	72

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

**Calibration with probe s/n. 23002639**

**UUC\* = Unit Under Calibration.**

-o0o-



## Agilent Technologies

Agilent Technologies (Thailand) Limited  
U CHU LIANG BLDG. 22/F UNIT A,D  
968 RAMA 4 ROAD, SILOM, BANGRAK  
Bangkok 10500 Thailand

Tel. +662 637 6363  
Fax: +662 632 4334  
Email: [ccc-smt@agilent.com](mailto:ccc-smt@agilent.com)  
Website: [www.agilent.com/chem](http://www.agilent.com/chem)

### Customer Contact:

ALS Laboratory Group (Thailand) Co  
Ltd  
Branch Number 0002  
114/1 Moo8 Banplu Subdistric Hat  
Yai District  
TAX ID : 0105540004859  
[kanitta.hemprasatpor@alsglobal.com](mailto:kanitta.hemprasatpor@alsglobal.com)  
0811721334

### Invoice To:

ALS Laboratory Group (Thailand) Co  
Ltd  
Branch Number 0002  
114/1 Moo8 Banplu Subdistric Hat  
Yai District SONGKHLA 90250

### Payer:

ALS Laboratory Group (Thailand) Co  
Ltd Head Office  
104 Phatthanakan 40 Phatthanakan Rd  
Khwaeng Phatthanakan Khet Suan  
Luang  
BANGKOK 10250

### Delivery Site:

ALS Laboratory Group (Thailand) Co  
Ltd  
Branch Number 0002  
114/1 Moo8 Banplu Subdistric Hat  
Yai District

### Location:

Room  
Bldg  
Lab  
Dept

## SERVICE REPORT

Customer Purchase Order Number:	Customer Number: 70579367
Service Request:	Service Request Date:
Service Order: 6005939422	Service Confirmation: 6905074481

REVIEW BY ....Kovinna J.....
APPROVED BY ....Kanitta H.....
NEXT CAL. DATE ....2/02/25.....

### Direct Inquiries to:

Contact Name:	Customer Contact Center
Contact E-mail:	<a href="mailto:ccc-smt@agilent.com">ccc-smt@agilent.com</a>
Contact Telephone:	+662 637 6363
Contact Fax:	+662 632 4334

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U Chu Liang Bldg. 22/F Unit A,D  
968 Rama 4 Road, Silom, Bangrak,  
Bangkok 10500 Thailand  
Tax ID : 0105542068218

Citibank N.A. Bangkok Branch  
399 Interchange 21 Building, Sukhumvit Road, Klongtoey Nau  
Sub-district, Wattana District, Bangkok 10110 Thailand  
Acc. No: 012-4452-007 ,  
THB:Krung Thai Bank PCL  
Siam Square Br.,416/1-2 Rama I Rd.,Pathumwan, BKK 10330  
Thailand

ORIGINAL

**Service Confirmation Number:** 6905074481

**Service Confirmation Date:** 02.08.2023

**Service Instrument:**

Model Number	Model Description	Serial Number	System Handle	Parent Asset
SYS-IM-7900	ICPMS 7900 System			
G7201C	ICP-MS MassHunter SW only (excludes PC)	USH3799575	ICP MS 7900	SYS-IM-7900
G8403A	Agilent 7900 ICP-MS	JP16511669	ICP MS 7900	SYS-IM-7900
G8411A	ISIS 3 for Agilent 7850/7900/8900	JP16510379	ICP MS 7900	SYS-IM-7900

**Service Items:**

Item	Service/Part #	Description	Qty	Entitlement	Service Start	Service End
1000	EOQ	Enterprise Operational Qualification	1.00	Agreement Entitlement - 100 % covered	02.08.2023	02.08.2023
1010	5185-5850	ICP-MS Checkout Solutions	1.00	Agreement Entitlement - 100 % covered		

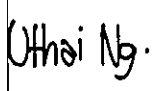
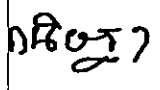
**Additional Information:**



**Service Confirmation Number:** 6905074481

**Service Confirmation Date:** 02.08.2023

**Service Information:**

<b>Problem Description:</b> WU-S-DQ-IM-7900-5001093854		
<b>Service Provided:</b> -Perform OQ hardware. -Test OQ of instrument ICP-MS = SGK_CL0048. All tests Passed.		
<b>Service Overview Code:</b> Reason Code: Scheduled Service Diagnosis Code: Scheduled Service Resolution Code: Scheduled Service		
<b>Reported Hours:</b> 9.0	<b>Travel Hours:</b> 3.0	
<b>Customer Field Service Representative Name:</b> Uthai Ngamlertsirichai	<b>Customer Field Service Representative Signature:</b> 	<b>Date:</b> 02 Aug 2023
<b>Customer Name:</b> KANITTA HEMPRASATPORN	<b>Customer Signature:</b> 	<b>Date:</b> 02 Aug 2023
<b>Additional Comments:</b>		

# Southern Calibration Service Co., Ltd.

669/35 Karnjanavanit Rd., Banpru, Hatyai, Songkla 90250 Thailand  
Tel : 08 1599 0417 Fax : 0 7480 5133 Email : s.calibration@gmail.com www.scal-lab.com



## CALIBRATION CERTIFICATE

Issued Date : 4-Jul-2024

Certificate No. : 24TH2757

CSR No. : A150/07473

Page. : 1 of 3

Customer : ALS Laboratory Group (Thailand) Co., Ltd  
114/1 Moo 8, Karnchanawanich Rd. Tambon, Ban Phru,  
Amphoe Hat Yai, Songkhla, 90250

Calibration Place : Chemical Laboratory

Instrument Name : Cold Room

Manufacturer : Danfoss

Model : N/A

Serial No. : N/A

ID No. : SGK\_CL0065

Resolution : 0.1 °C

Received Date : 1-Jul-2024

Calibrated Date : 1-Jul-2024

Ambient Temperature : (30 ± 10) °C

Relative Humidity : (50 ± 30) %

REVIEW BY ..... Ananta B.  
APPROVED BY ..... Kanitha H.  
NEXT CAL. DATE ..... 1/01/26

### Calibration Method Used :

This instrument was calibrated using the Calibration In - house method : SCAL.WI.012 based on GLA - 20

The Southern Calibration Service Co.,Ltd.calibration control system complies with requirement of ISO/IEC 17025:2017

### Traceability of measurement :

This Certificate is traceable to the International and /or national standards which realize the units of measurement according to the International System of Unit (SI) through :

- TISTR : Thailand Institute of Scientific and Technological Research

Calibrated by : Ibrorhim Saleemin

Approved by :

Imron Rattanaylum / Technical Manager



The uncertainties are for a confidence probability of approximately 95%

This certificate may not be reproduced other than in full, except with the prior written approval of Southern Calibration Service Co., Ltd.

### Details of Calibration

#### 1. Reference Standard Equipment Used:

Equipment	Model	Serial No.	Cert. no.	Due Date
Data Acquisition/Switch Unit	34970A	MY58009813	PSL-T0707-1/67	22-May-2025

2. The results reported in this certificate refer to the condition of the instrument on the date of calibration

and carry no implication regarding the longterm stability of instrument.

3. This certificate is not certified any commercial transaction

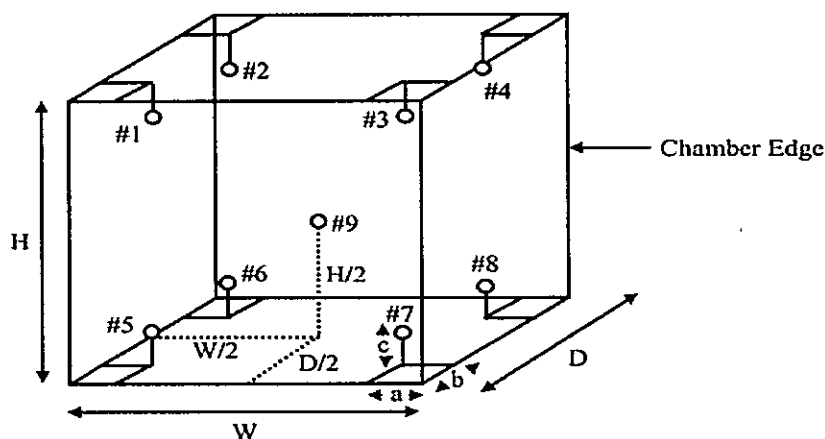
4. Condition of Item : normal condition , no indication for any damage or malfunction

#### Result of Calibration :

( ☒ ) Without Adjustment

( ☐ ) After Adjustment

#### 1. Sensor Installation Diagram



#### Sensor Installation Details

a = 5.0 cm

b = 5.0 cm

c = 5.0 cm

#### Dimension of the chamber

W = 40.0 cm

H = 40.0 cm

D = 33.0 cm



Certificate No. : 24TH2757

CSR No. : A150/07473

Page. : 3 of 3

**Result of Calibration :**

**2. Temperature Measurement Accuracy Test**

The measurement results of the Cold Room and associates are reported in the manner as shown below

Cal point ( °C )	Measured Standard Temperature At Spread Locations ( °C )									Uncertainty ( ± °C )
	#1	#2	#3	#4	#5	#6	#7	#8	Ref. 9	
4	3.90	4.04	3.72	3.78	3.69	3.76	3.55	3.43	3.34	0.39

**3. Performance Result**

The performance of the Cold Room are reported as shown below

Cal point ( °C )	UUC Setting ( °C )	UUC Reading ( °C )	Temperature Stability ( ± °C )	Temperature Uniformity ( °C )	Overall Variation ( °C )
4	4.0	4.0	0.10	0.75	0.75

- UUC = Unit Under Calibration

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

... End ...





**Southern Calibration Service Co., Ltd.**

669/35 Karnjanavanit Rd., Banpru, Hatyai, Songkla 90250 Thailand  
Tel : 08 1599 0417 Fax : 0 7480 5133 Email : s.calibration@gmail.com www.scal-lab.com



## CALIBRATION CERTIFICATE

Issued Date : 16-Jul-2023

Certificate No. : 23TH3096

CSR No. : A095/04743

Page. : 1 of 3

Customer : ALS Laboratory Group (Thailand) Co., Ltd  
114/1 Moo 8, Karnchanawanich Rd. Tambon, Ban Phru,  
Amphoe Hat Yai, Songkhla, 90250

Calibration Place : Chemical Laboratory  
Instrument Name : Incubator  
Manufacturer : Memmert  
Model : ICP750  
Serial No. : F816.0063  
ID No. : SGK\_CL0028  
Resolution : 0.1 °C  
Received Date : 13-Jul-2023  
Calibrated Date : 13-Jul-2023  
Ambient Temperature : (30 ± 10) °C  
Relative Humidity : (50 ± 30) %

REVIEW BY .....Ananta B.....  
APPROVED BY .....Kamtha H.....  
NEXT CAL. DATE .....13/01/25.....

### Calibration Method Used :

This instrument was calibrated using the Calibration In - house method : SCAL.WI.012 based on GLA - 20

The Southern Calibration Service Co.,Ltd.calibration control system complies with requirement of ISO/IEC 17025:2017

### Traceability of measurement :

This Certificate is traceable to the International and /or national standards which realize the units of measurement according to the International System of Unit (SI) through :

- ScaL : Sounthern Calibration Service Co., Ltd.,

Calibrated by : Ibrorhim Saleemin

Approved by :

Imron Rattanaylum / Technical Manager

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

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### Details of Calibration

#### 1. Reference Standard Equipment Used:

Equipment	Model	Serial No.	Cert. no.	Due Date
Data Acquisition/Switch Unit	34970A	MY58009813	23SDAT004	23-May-2024

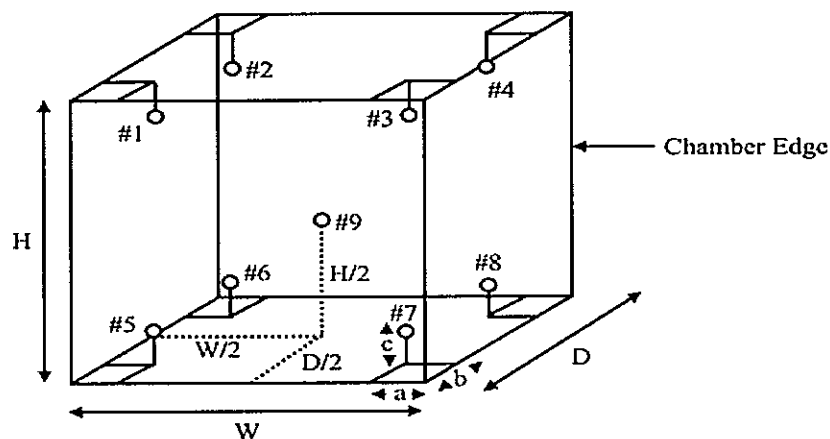
2. The results reported in this certificate refer to the condition of the instrument on the date of calibration and carry no implication regarding the longterm stability of instrument.

3. This certificate is not certified any commercial transaction

4. Condition of Item : normal condition , no indication for any damage or malfunction

Result of Calibration : ( ☒ ) Without Adjustment ( ☐ ) After Adjustment

#### 1. Sensor Installation Diagram



#### Sensor Installation Details

a = 5.0 cm  
b = 5.0 cm  
c = 5.0 cm

#### Dimension of the chamber

W = 40.0 cm  
H = 40.0 cm  
D = 33.0 cm



Certificate No. : 23TH3096

CSR No. : A095/04743

Page. : 3 of 3

**Result of Calibration :**

**2. Temperature Measurement Accuracy Test**

The measurement results of the Incubator and associates are reported in the manner as shown below

Cal point ( °C )	Measured Standard Temperature At Spread Locations ( °C )									Uncertainty ( ± °C )
	#1	#2	#3	#4	#5	#6	#7	#8	Ref. 9	
20	20.10	20.04	20.03	19.97	20.08	20.23	20.10	19.94	20.07	0.38

**3. Performance Result**

The performance of the Incubator are reported as shown below

Cal point ( °C )	UUC Setting ( °C )	UUC Reading ( °C )	Temperature Stability ( ± °C )	Temperature Uniformity ( °C )	Overall Variation ( °C )
20	20.0	20.0	0.14	0.17	0.32

- UUC = Unit Under Calibration

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

... End ...



**TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)**  
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TEL. 0-2717-3000 FAX. 0-2719-9484

## Certificate of Testing

**Cert.No.:** 24TW96

**Page.:** 1 of 2

<b>Equipment :</b>	DO Meter
<b>Manufacturer :</b>	YSI
<b>Model :</b>	5000
<b>Serial No. :</b>	17B101473
<b>ID No. :</b>	SGK_CL0073
<b>Received Date :</b>	17 May 2024
<b>Test Date :</b>	21 May 2024
<b>Reference :</b>	2405-0608DSC-1
<b>Submitted by :</b>	ALS Laboratory Group (Thailand) Co.,Ltd. Songkhla Branch. 114/1 Moo 8 Karnchanawanich Rd., T.Ban Phru, A.Hat Yai, Songkhla 90250 Thailand
<b>Laboratory Condition :</b>	Temperature ( $25 \pm 5$ ) °C Humidity ( $50 \pm 20$ ) %
<b>Test Procedure :</b>	In - house method : CP-CH9 by Comparison Technique with Azide Modification Method
<b>Tested by :</b>	Walalak Sirithean
<b>Approved by :</b>	 Approved Signatory
( ) Unnopphol Harachai ( ) Ponpan Paipim (✓) Saithip Meangmai	

**Issue Date :** 21 May 2024

REVIEW BY *Ananta S*  
APPROVED BY *Kanitta H*  
NEXT CAL DATE **21/11/25**





**Cert.No.:** 24TW96

**Page.:** 2 of 2

**Condition of this result of calibration**

**1. Reference Standard Instruments :**

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

<u>Instruments</u>	<u>Serial No.</u>	<u>ID No.</u>	<u>Certificate No.</u>	<u>Due Date</u>
1. Burette	-	130BU10	23CG1172	22 Mar 2025
2. Balance	14233821	110RC001	23MM405	16 July 2024

**2. Standard Material :-**

<u>Material</u>	<u>Manufacturer</u>	<u>Lot.No.</u>	<u>Assay</u>
Sodium Thiosulfate pentahydrate	Merck	AM1763316	100.2%

**Result :**      **Dissolved Oxygen Meter Adjustment With Air 100 %**

**Dissolved Oxygen Probe No.:**      17B100103

<b>Titration Method (Azide Modification Method)</b> (mg/L)	<b>DO Meter Reading</b> (mg/L)	<b>Standard Deviation</b> (mg/L)
8.18	8.18	0.0071

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

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**TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)**  
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## Certificate of Calibration

Cert. No.: 24LM77

Page.: 1 of 2

**Equipment :** DO Meter with Sensor

**Manufacturer :** YSI

**Model :** 5000-115

**Serial No. :** 17B101473

**ID No. :** SGK\_CL0073

**Submitted by :** ALS Laboratory Group (Thailand) Co.,Ltd.  
Songkhla Branch.  
114/1 Moo 8 Karnchanawanich Rd.,  
T.Ban Phru, A.Hat Yai,  
Songkhla 90250 Thailand

**Location :** TPA On Site Calibration Laboratory

**Received Order :** 17 May 2024


**Calibrated Date :** 27 May 2024

**Ambient Temperature :** ( 26 ± 10 ) °C

**Relative Humidity :** ( 50 ± 30 ) %

**AC Line Voltage :** ( 220 ± 22 ) V

**Calibrated by :** Khit Ruttanaprapachai

**Approved by :**   
Approved Signatory

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

**Issue Date :** 28 May 2024

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

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



**Equipment :** DO Meter with Sensor  
**Condition As-Received :** Used Item  
**Reference :** 2405-0608DSC-2

**Cert. No.:** 24LM77

**Page.:** 2 of 2

**Procedure Used :-**

Calibration were conducted using in-house calibration procedure CP-OT01 according to comparison with Industrial Platinum Resistance Thermometer ( IPRT ) into Temperature Bath.

The temperature scale used was based on ITS-90.

**Condition of this result of calibration**

1. Reference standard instrument:-

<u>Instrument</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Traceable</u>	<u>Due Date</u>
1) Digital Thermometer	2188080	231216	TPA	11 Oct 2024
2. This certificate is valid only to the item calibrated on date and place of calibration.				
3. This certification is traceable to the International System of Unit.				

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

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

**Function :** Temperature measurement.

This instrument was connected with temperature sensor, S/N.: 17B100103

<u>Calibration Point</u> ( °C )	<u>Immersion Depth</u> ( mm )	<u>Standard Temperature</u> ( °C )	<u>UUC* Reading</u> ( °C )	<u>Error</u> ( °C )	<u>Uncertainty</u> ( ± °C )	<u>Coverage Factor</u> <i>k</i>
20.00	60	20.005	19.79	-0.215	0.15	2.00

**UUC\* :** Unit Under Calibration

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

-o0o-



TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)  
CORPORATE SERVICES 3 : EQUIPMENT CALIBRATION AND TESTING SERVICES

534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250

TEL. 0-2717-3000-29 FAX. 0-2719-9484

Cert. No.: 24TM152

Page.: 1 of 3

## Certificate of Calibration

Equipment : COD Reactor  
Manufacturer : Hach  
Model : DRB200  
Serial No. : 21120C1313  
ID No. : SGK\_CL0085  
Submitted by : ALS Laboratory Group (Thailand) Co.,Ltd.  
(Songkhla Branch)  
114/1 Moo 8 Kanjanavanij Rd., Banphru,  
Hatyai, Songkhla 90250 Thailand  
Location : Chemistry Room  
Received Order : 24 January 2024  
Calibration Date : 24 - 25 January 2024  
Ambient Temperature : ( 26 ± 10 ) °C  
Relative Humidity : ( 50 ± 30 ) %

Calibrated by : Kunchit Promprat

Approved by :

- ( ) Pornthippa Tameyakul  
( ) Ponpan Paipim  
(✓) Suwit Imjai

Issue Date : 29 January 2024

REVIEW BY	.....Ananta B.....
APPROVED BY	.....Kanitta H.....
NEXT CAL. DATE	24/01/25

  
\_\_\_\_\_  
Approved Signatory

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

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

A 0012840





Equipment : COD Reactor  
 Condition As-Received : Used Item  
 Reference : 2401-0645OC-3  
 Procedure Used :-

Cert. No.: 24TM152

Page.: 2 of 3

As agreed with customer the calibration was perform using in-house calibration method according to directed measurement method with Data Acquisition which connected with Thermocouple Type T.

The temperature scale used was based on ITS-90.

### Condition of this result of calibration

1. Reference standard instrument:-

<u>Instrument</u>	<u>Serial No.</u>	<u>Cert. No.</u>	<u>Traceable</u>	<u>Due Date</u>
1 ) Data Acquisition	MY44073381	23LM95	TPA	19 Jun 2024

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

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

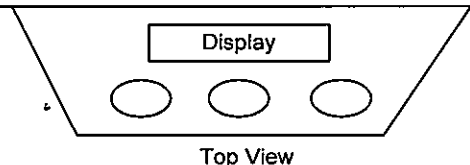
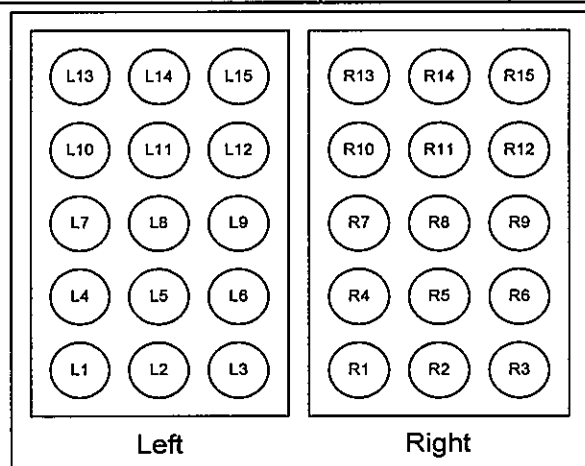
Remark : TPA : Technology Promotion Association ( Thailand - Japan )

Result of Calibration :- ( \* ) Without Adjustment

Function of UUC\* : Temperature Source

Heat transfer medium used : Alumina Calcined

Environment during calibration		
	Beginning	Finished
Temp.(°C)	26	27
REL.Humi.(%)	54	61
AC Supply (Volt)	226	227



Left		Right	
Position	ID No. of Sensor	Position	ID No. of Sensor
L1	23-01TC-01	R1	23-01TC-01
L2	23-01TC-02	R2	23-01TC-02
L3	23-01TC-03	R3	23-01TC-03
L4	23-01TC-04	R4	23-01TC-04
L5	23-01TC-05	R5	23-01TC-05
L6	23-01TC-06	R6	23-01TC-06
L7	23-01TC-07	R7	23-01TC-07
L8	23-01TC-08	R8	23-01TC-08
L9	23-01TC-09	R9	23-01TC-09
L10	23-01TC-10	R10	23-01TC-10
L11	23-01TC-01	R11	23-01TC-01
L12	23-01TC-02	R12	23-01TC-02
L13	23-01TC-03	R13	23-01TC-03
L14	23-01TC-04	R14	23-01TC-04
L15	23-01TC-05	R15	23-01TC-05

*Unit*

a 1199640



**Equipment :** COD Reactor  
**Condition As-Received :** Used Item  
**Reference :** 2401-0645OC-3  
**Result of Calibration :-** ( \* ) Without Adjustment  
**Function of UUC\* :** Temperature Source  
**Calibration Point :** 150 °C

**Cert. No.:** 24TM152

**Page.:** 3 of 3

UUC* Setting ( °C )	UUC* Reading ( °C )	Measured Temperature ( °C )						Temperature stability ( ± °C )	Uncertainty ( ± °C )	Coverage Factor <i>k</i>
		Position								
		Left			Right					
150	150	L13	L14	L15	R13	R14	R15	0.12	1.1	2
		148.341	148.341	148.230	148.998	149.015	149.078			
		L10	L11	L12	R10	R11	R12			
		149.185	148.528	148.840	149.456	148.501	148.504			
		L7	L8	L9	R7	R8	R9			
151	151	149.460	149.692	150.210	149.845	150.020	150.266	0.10		
		L4	L5	L6	R4	R5	R6			
		149.759	149.784	149.899	150.332	149.962	150.233			
		L1	L2	L3	R1	R2	R3			
		149.241	149.588	149.525	149.776	149.847	149.313			

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

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

**UUC\* :** Unit Under Calibration

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

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

-o0o-

*Yusuf*

a 1199639



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



Cert.No.: 24CHO44

Page.: 1 of 3

## Certificate of Calibration

**Equipment :** Spectrophotometer  
**Manufacturer :** Hach  
**Model :** DR 3900  
**Serial No. :** 1687645  
**ID No. :** SGK\_CL0038  
**Condition As-Received:** Used Item  
**Received Date :** 24 January 2024  
**Calibration Date :** 24 January 2024  
**Reference :** 2401-0645OC-2  
**Submitted by :** ALS Laboratory Group (Thailand) Co.,Ltd. Songkhla Branch.  
114/1 Moo 8 , Kanjanavanij Rd.,  
Banphru , Hatyai ,  
Songkhla 90250 , Thailand

REVIEW BY ..... Ananta B .....  
APPROVED BY ..... Kanitta H. ....  
NEXT CAL. DATE 24/01/25

**Calibration Place :** Chemistry Room  
**Ambient Temperature :** ( 26.4 - 25.6 ) °C (On-Site)  
**Relative Humidity :** ( 61.5 - 64.1 ) % (On-Site)  
**Calibration Procedure :** In - house method :  
CP-OCH4 based on ASTM E 275-01

**Calibrated by :** Kunchit Promprat

**Approved by :**

Approved Signatory

- ( ) Saithip Meangmai  
( ) Warakorn Lerngagtrakul  
( ✓ ) Ponpan Paipim

**Issue Date :** 29 January 2024

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

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Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.

A 0062930



Cert. No. : 24CHO44

Page : 2 of 3

**Condition of calibration result**

1. Reference Standard Material :

<u>Material</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due date</u>
1. Absorbance Standard set	8331	105939	28 Sep 2024
2. Wavelength Standard set	29829	114509	11 Sep 2025
3. Wavelength Standard set	29829	114510	11 Sep 2025

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

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

- Starna Scientific Ltd.

4. Spectral BandWidth : 5 nm  
Scan Speed : - nm/min

**Calibration Results : without adjustment**

**Wavelength Accuracy**

<b>Certified Values of Reference Material ( nm )</b>	<b>UUC Reading ( nm )</b>	<b>Uncertainty of Measurement ( <math>\pm</math> nm )</b>	<b>Coverage Factor <i>k</i></b>
418.40	418	0.59	2.00
479.88	480	0.59	2.00
513.75	514	0.59	2.00
537.00	537	0.59	2.00
638.00	638	0.59	2.00
684.70	685	0.59	2.00
747.61	748	0.59	2.00
807.04	807	0.59	2.00

a 1199642





Cert. No. : 24CHO44

Page : 3 of 3

**Calibration Results : without adjustment**

**Photometric Accuracy**

Wavelength (nm)	Certified Values of Reference Material ( Abs )	UUC Reading ( Abs )	Uncertainty of Measurement ( $\pm$ Abs )	Coverage Factor <i>k</i>
420.0	Zero	0.000	0.0028	2.00
	0.5712	0.572	0.0031	2.00
	0.7510	0.752	0.0032	2.00
	1.0893	1.092	0.0033	2.00
440.0	Zero	0.000	0.0028	2.00
	0.5607	0.560	0.0030	2.00
	0.7336	0.733	0.0030	2.00
	1.0636	1.063	0.0031	2.00
465.0	Zero	0.000	0.0028	2.00
	0.5111	0.514	0.0030	2.00
	0.6768	0.679	0.0029	2.00
	0.9802	0.985	0.0029	2.00
546.1	Zero	0.000	0.0028	2.00
	0.5224	0.522	0.0028	2.00
	0.6856	0.684	0.0029	2.00
	0.9937	0.993	0.0028	2.00
590.0	Zero	0.000	0.0028	2.00
	0.5542	0.551	0.0028	2.00
	0.7155	0.712	0.0028	2.00
	1.0366	1.033	0.0028	2.00
635.0	Zero	0.000	0.0028	2.00
	0.5397	0.538	0.0028	2.00
	0.6832	0.680	0.0029	2.00
	0.9886	0.986	0.0028	2.00

**Remark \***

- Each individual filter is measured against the empty filter holder (blank) used to zero the spectrophotometer

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

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**a 1199641**



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



Cert.No.: 24CHO43

Page.: 1 of 4

## Certificate of Calibration

**Equipment :** UV-VIS Spectrophotometer  
**Manufacturer :** Agilent  
**Model :** Cary 60 UV-Vis  
**Serial No. :** MY16510028  
**ID No. :** SGK\_CL0040  
**Condition As-Received:** Used Item  
**Received Date :** 24 January 2024  
**Calibration Date :** 25 January 2024  
**Reference :** 2401-0645OC-1  
**Submitted by :** ALS Laboratory Group (Thailand) Co.,Ltd. Songkhla Branch.  
114/1 Moo 8, Kanjanavanij Rd.,  
Banphru, Hatyai,  
Songkhla 90250, Thailand  
**Calibration Place :** Chemistry Room  
**Ambient Temperature :** ( 26.8 - 27.2 ) °C (On-Site)  
**Relative Humidity :** ( 59.3 - 64.5 ) % (On-Site)  
**Calibration Procedure :** In - house method :  
CP-OCH4 based on ASTM E 275-01

REVIEW BY	Ananta B.
APPROVED BY	Kanitta H.
NEXT CAL. DATE	25/01/25

**Calibrated by :** Kunchit Promprat

**Approved by :**

Approved Signatory

- ( ) Saithip Meangmai  
( ) Warakorn Lernagatrakul  
(X) Ponpan Paipim

**Issue Date :** 29 January 2024

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

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Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.

A 0062928



Cert. No. : 24CHO43

Page : 2 of 4

**Condition of calibration result**

1. Reference Standard Material :

<u>Material</u>	<u>Serial No.</u>	<u>Certificate No.</u>	<u>Due date</u>
1. Absorbance Standard set	32588	103225	08 Jul 2024
2. Absorbance Standard set	32592	104226	04 Aug 2024
3. Absorbance Standard set	8331	105939	28 Sep 2024
4. Wavelength Standard set	29829	114509	11 Sep 2025
5. Wavelength Standard set	29829	114510	11 Sep 2025

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

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

- Starna Scientific Ltd.

4. Spectral BandWidth : 1.5 nm

Scan Speed : 20 nm/min

**Calibration Results : without adjustment**

**Wavelength Accuracy**

<b>Certified Values of Reference Material ( nm )</b>	<b>UUC Reading ( nm )</b>	<b>Uncertainty of Measurement ( <math>\pm</math> nm )</b>	<b>Coverage Factor <i>k</i></b>
241.72	241.0	0.15	2.05
334.06	333.4	0.13	2.00
418.59	418.2	0.13	2.00
573.17	573.3	0.18	2.09
879.29	879.1	0.16	2.05

**a 1199645**



Cert. No. : 24CHO43

Page : 3 of 4

**Calibration Results : without adjustment****Photometric Accuracy**

Wavelength (nm)	Certified Values of Reference Material ( Abs )	UUC Reading ( Abs )	Uncertainty of Measurement ( $\pm$ Abs )	Coverage Factor <i>k</i>
420.0	Zero	0.0000	0.0028	2.00
	0.5712	0.5717	0.0030	2.00
	0.7510	0.7565	0.0031	2.00
	1.0893	1.0869	0.0032	2.00
440.0	Zero	0.0000	0.0028	2.00
	0.5607	0.5615	0.0029	2.00
	0.7336	0.7393	0.0029	2.00
	1.0636	1.0623	0.0030	2.00
465.0	Zero	0.0001	0.0028	2.00
	0.5111	0.5119	0.0029	2.00
	0.6768	0.6823	0.0028	2.00
	0.9802	0.9791	0.0029	2.00
546.1	Zero	0.0001	0.0028	2.00
	0.5224	0.5225	0.0028	2.00
	0.6856	0.6882	0.0028	2.00
	0.9937	0.9906	0.0028	2.00
590.0	Zero	0.0001	0.0028	2.00
	0.5542	0.5536	0.0028	2.00
	0.7155	0.7168	0.0028	2.00
	1.0366	1.0324	0.0028	2.00
635.0	Zero	0.0000	0.0028	2.00
	0.5397	0.5396	0.0028	2.00
	0.6832	0.6844	0.0028	2.00
	0.9886	0.9848	0.0028	2.00

**Remark**

- Each individual filter is measured against the empty filter holder (blank) used to zero the spectrophotometer

**a 1199644**





Cert. No. : 24CHO43

Page : 4 of 4

**Calibration Results : without adjustment**

**Photometric Accuracy**

Wavelength (nm)	Certified Values of Reference Material ( Abs )	UUC Reading ( Abs )	Uncertainty of Measurement ( $\pm$ Abs )	Coverage Factor <i>k</i>
235.0	Zero	0.0000	0.0046	2.00
	0.4940	0.4916	0.0049	2.00
	Zero	0.0000	0.0050	2.00
	0.7367	0.7370	0.0066	2.00
257.0	Zero	0.0000	0.0046	2.00
	0.5733	0.5696	0.0049	2.00
	Zero	0.0000	0.0050	2.00
	0.8592	0.8565	0.0059	2.00
313.0	Zero	0.0000	0.0046	2.00
	0.1914	0.1918	0.0047	2.00
	Zero	0.0000	0.0050	2.00
	0.2861	0.2889	0.0058	2.00
350.0	Zero	0.0000	0.0046	2.00
	0.4253	0.4234	0.0051	2.00
	Zero	0.0000	0.0050	2.00
	0.6389	0.6376	0.0056	2.00

**Remark**

- The Potassium Dichromate filled cells are measured against a Perchloric acid blank.

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

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a 1199643

# Southern Calibration Service Co., Ltd.

669/35 Karnjanavanit Rd., Banpru, Hatyai, Songkla 90250 Thailand  
Tel : 08 1599 0417 Fax : 0 7480 5133 Email : s.calibration@gmail.com www.scal-lab.com



## CALIBRATION CERTIFICATE

Issued Date : 18-Jan-2024

Certificate No. : 24MA0199

CSR No. : A123/06123

Page. : 1 of 3

Customer : ALS Laboratory Group (Thailand) Co., Ltd  
114/1 Moo 8, Karnchanawanich Rd. Tambon, Ban Phru,  
Amphoe Hat Yai, Songkhla, 90250

Calibration Place : Chemical Laboratory  
Instrument Name : Electronic Balance  
Manufacturer : Sartorius  
Model : MSE224S-100-DU  
Serial No. : 34705158  
ID No. : SGK\_CL0045  
Resolution : 0.0001 g  
Received Date : 15-Jan-2024  
Calibrated Date : 15-Jan-2024  
Ambient Temperature :  $(30 \pm 10) ^\circ\text{C}$   
Relative Humidity :  $(50 \pm 20) \%$

REVIEW BY ..... Ananta B.  
APPROVED BY ..... Kamitta H.  
NEXT CAL. DATE ..... 15/1/25

### Calibration Method Used :

This instrument was calibrated using the Calibration In - house method : SCAL.WI.001 based on UKAS LAB 14 : 2015

The Southern Calibration Service Co.,Ltd.calibration control system complies with requirement of ISO/IEC 17025:2017

### Traceability of measurement :

This Certificate is traceable to the International and /or national standards which realize the units of measurement according to the International System of Unit (SI) through :

- SCaL : Sounthern Calibration Service Co., Ltd.,

Calibrated by : Hadbordee Dettawee

Approved by :

Imron Rattanaylum / Technical Manager



The uncertainties are for a confidence probability of approximately 95%

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Certificate No. : 24MA0199

CSR No. : A123/06123

Page. : 2 of 3

### Details of Calibration

#### 1. Reference Standard Equipment Used:

Equipment	Model	Serial No.	Cert. no.	Due Date
Standard Weight Set	2 mg - 1 kg	11119514/01	23SWS001	4-Jul-2024

2. The results reported in this certificate refer to the condition of the instrument on the date of calibration

and carry no implication regarding the longterm stability of instrument.

3. This certificate is not certified any commercial transaction

4. Condition of Item : normal condition , no indication for any damage or malfunction

Result of Calibration :.                      (✓) Without Adjustment                      ( ) After Adjustment

#### 1. Repeatability

Nominal Value ( g )	Standard Deviation ( g )
20	0.00000
200	0.00000

#### 2. Effect of tare

Nominal Value ( g )	Standard Value ( g )	Balance Reading ( g )	Correction ( g )
20	20.0000	20.0000	0.0000
40	40.0001	40.0000	0.0001
60	60.0000	60.0001	-0.0001
80	80.0001	80.0001	-0.0001
100	100.0000	100.0000	0.0000

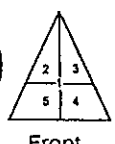
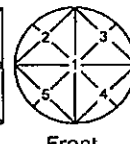
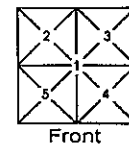
## Result of Calibration :

### 3. Off-centre loading

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

The balance reading obtained are given in the table.

Position					Maximum Difference ( g )
1	2	3	4	5	
100.0000	100.0001	100.0000	100.0000	100.0000	0.0001



### 4. Departure from nominal value

Nominal Value ( g )	Standard Value ( g )	UUC Reading ( g )	Correction ( g )	Uncertainty ( $\pm$ g )	Coverage Factor ( k )
0	0.0000	0.0000	0.0000	0.00008	2.0
0.01	0.0100	0.0100	0.0000	0.00008	2.0
0.1	0.1000	0.1000	0.0000	0.00008	2.0
0.5	0.5000	0.5000	0.0000	0.00008	2.0
1	1.0000	1.0000	0.0000	0.00008	2.0
2	2.0000	2.0000	0.0000	0.00008	2.0
5	5.0000	5.0000	0.0000	0.00009	2.0
10	10.0000	10.0000	0.0000	0.00009	2.0
20	20.0000	20.0000	0.0000	0.00009	2.0
50	50.0000	50.0000	0.0000	0.00011	2.0
100	100.0000	100.0000	0.0000	0.00016	2.0
120	120.0000	120.0000	0.0000	0.00024	2.0
140	140.0001	140.0000	0.0001	0.00024	2.0
160	160.0000	160.0000	0.0000	0.00026	2.0
180	180.0000	180.0000	0.0000	0.00029	2.0
200	200.0000	200.0000	0.0000	0.00030	2.0

- UUC = Unit Under Calibration

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

...End...





# CALIBRATION CERTIFICATE

Issued Date : 22-Oct-2024

Certificate No. : 24TH4295

CSR No. : A163/08133

Page. : 1 of 3

Customer : ALS Laboratory Group (Thailand) Co., Ltd  
114/1 Moo 8, Karnchanawanich Rd. Tambon, Ban Phru,  
Amphoe Hat Yai, Songkhla, 90250

Calibration Place : Chemical Laboratory  
Instrument Name : Hot Air Oven  
Manufacturer : Memmert  
Model : UF110  
Serial No. : B416.3387  
ID No. : SGK\_CL0024  
Resolution : 0.1 °C  
Received Date : 19-Oct-2024  
Calibrated Date : 19-Oct-2024  
Ambient Temperature : (30 ± 10) °C  
Relative Humidity : (50 ± 30) %

REVIEW BY	Ananta B.
APPROVED BY	Kanitta H.
NEXT CAL. DATE	19/04/2026

## Calibration Method Used :

This instrument was calibrated using the Calibration In - house method : SCAL.WI.012 based on GLA - 20

The Southern Calibration Service Co.,Ltd.calibration control system complies with requirement of ISO/IEC 17025:2017

## Traceability of measurement :

This Certificate is traceable to the International and /or national standards which realize the units of measurement according to the International System of Unit (SI) through :

- TISTR : Thailand Institute of Scientific and Technological Research

Calibrated by : Ibrorhim Saleemin

Approved by :

Imron Rattanaylum / Technical Manager



The uncertainties are for a confidence probability of approximately 95%

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### Details of Calibration

#### 1. Reference Standard Equipment Used:

Equipment	Model	Serial No.	Cert. no.	Due Date
Data Acquisition/Switch Unit	34970A	MY58009813	PSL-T0707-1/67	22-May-2025

2. The results reported in this certificate refer to the condition of the instrument on the date of calibration

and carry no implication regarding the longterm stability of instrument.

3. This certificate is not certified any commercial transaction

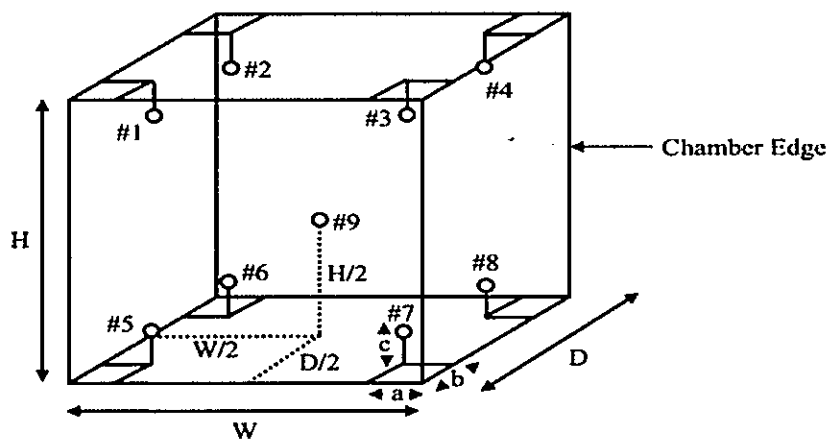
4. Condition of Item : normal condition , no indication for any damage or malfunction

#### Result of Calibration .:

( ✓ ) Without Adjustment

( ) After Adjustment

#### 1. Sensor Installation Diagram



#### Sensor Installation Details

a = 5.0 cm

b = 5.0 cm

c = 5.0 cm

#### Dimension of the chamber

W = 55.0 cm

H = 48.0 cm

D = 40.0 cm

## Result of Calibration :

### 2. Temperature Measurement Accuracy Test

The measurement results of the Hot Air Oven and associates are reported in the manner as shown below

Cal point (°C)	Measured Standard Temperature At Spread Locations (°C)									Uncertainty (±°C)
	#1	#2	#3	#4	#5	#6	#7	#8	Ref. 9	
40	40.36	40.40	40.51	40.43	40.05	40.24	40.09	40.14	39.75	0.38
70	70.27	70.30	70.45	70.24	70.24	70.43	70.29	70.30	69.95	0.36
103	102.94	102.90	103.55	102.96	103.22	103.14	103.10	103.01	102.88	0.36
104	104.15	103.99	104.27	104.06	104.09	104.23	104.26	104.15	103.90	0.36
105	105.04	104.90	105.05	104.87	104.91	104.80	104.82	104.98	104.70	0.36
180	179.19	178.93	179.82	179.10	179.27	179.68	179.12	179.73	179.12	0.41

### 3. Performance Result

The performance of the Hot Air Oven are reported as shown below

Cal point (°C)	UUC Setting (°C)	UUC Reading (°C)	Temperature Stability (±°C)	Temperature Uniformity (°C)	Overall Variation (°C)
40	40.0	40.0	0.20	0.84	0.84
70	70.0	70.0	0.10	0.59	0.59
103	103.0	103.0	0.20	0.73	0.74
104	104.0	104.0	0.20	0.47	0.56
105	105.0	105.0	0.20	0.44	0.46
180	180.0	180.0	0.50	0.86	1.11

- UUC = Unit Under Calibration

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

... End ...



**Southern Calibration Service Co., Ltd.**

669/35 Karnjanavanit Rd., Banpru, Hatyai, Songkla 90250 Thailand  
Tel : 08 1599 0417 Fax : 0 7480 5133 Email : s.calibration@gmail.com www.scal-lab.com



## CALIBRATION CERTIFICATE

Issued Date : 16-Jul-2023

Certificate No. : 23TH3097

CSR No. : A095/04743

Page. : 1 of 3

Customer : ALS Laboratory Group (Thailand) Co., Ltd  
114/1 Moo 8, Karnchanawanich Rd. Tambon, Ban Phru,  
Amphoe Hat Yai, Songkhla, 90250

Calibration Place : Chemical Laboratory

Instrument Name : Water Bath

Manufacturer : Memmert

Model : WNE29

Serial No. : L616.0538

ID No. : SGK\_CL0035

Resolution : 0.1 °C

Received Date : 13-Jul-2023

Calibrated Date : 13-Jul-2023

Ambient Temperature : (30 ± 10) °C

Relative Humidity : (50 ± 30) %

REVIEW BY Ananta B.

APPROVED BY Kanitha B.

NEXT CAL. DATE 13/01/25

### Calibration Method Used :

This instrument was calibrated using the Calibration In - house method : SCAL.WI.014 based on ASTM E 715 : 1980  
(reapproved 2001)

The Southern Calibration Service Co.,Ltd.calibration control system complies with requirement of ISO/IEC 17025:2017

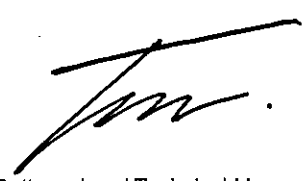
### Traceability of measurement :

This Certificate is traceable to the International and /or national standards which realize the units of measurement  
according to the International System of Unit (SI) through :

- SCaL : Sounthern Calibration Service Co., Ltd.,

Calibrated by : Ibrorhim Saleemin

Approved by :

  
Imron Rattanaylum / Technical Manager

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

This certificate may not be reproduced other than in full, except with the prior written approval of Southern Calibration Service Co., Ltd.



### Details of Calibration

#### 1. Reference Standard Equipment Used:

Equipment	Model	Serial No.	Cert. no.	Due Date
Data Acquisition/Switch Unit	34970A	MY58009813	23SDAT004	23-May-2024

2. The results reported in this certificate refer to the condition of the instrument on the date of calibration

and carry no implication regarding the longterm stability of instrument.

3. This certificate is not certified any commercial transaction

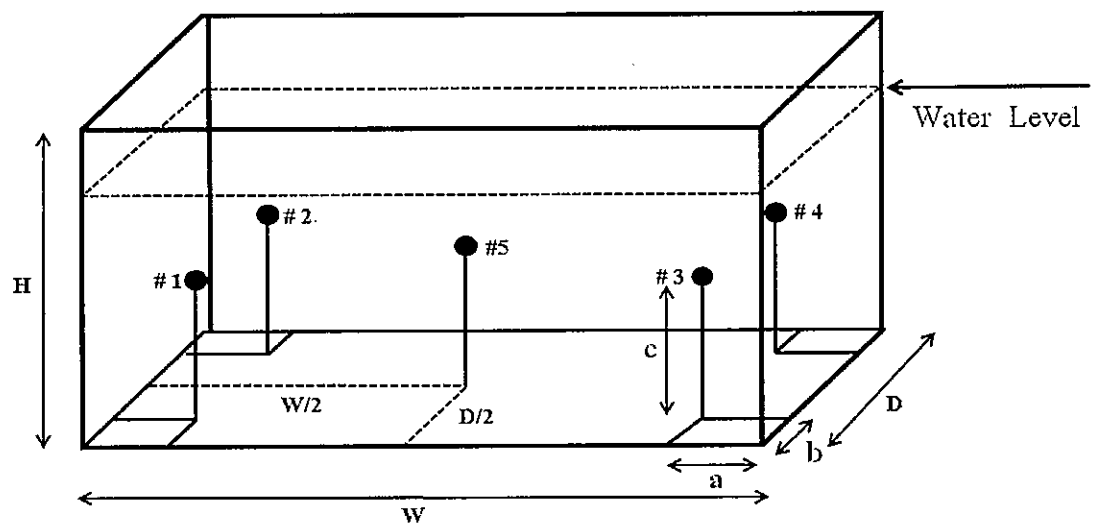
4. Condition of Item : normal condition , no indication for any damage or malfunction

#### Result of Calibration .:

( ✓ ) Without Adjustment

( ) After Adjustment

#### 1. Sensor Installation Diagram



#### Sensor Installation Details

a = 5 cm  
b = 5 cm  
c = 5 cm

#### Dimension of the chamber

W = 45 cm  
H = 30 cm  
D = 35 cm



Certificate No. : 23TH3097

CSR No. : A095/04743

Page. : 3 of 3

**Result of Calibration :**

**2. Temperature Measurement Accuracy Test**

The measurement results of the Water Bath and associates are reported in the manner as shown below

Cal point ( °C )	Measured Standard Temperature At Spread Locations ( °C )					Uncertainty ( ± °C )
	#1	#2	#3	#4	Ref.5	
80	79.17	79.47	79.43	79.25	79.38	0.14

**3. Performance Result**

The performance of the Water Bath are reported as shown below

Cal point ( °C )	UUC Setting ( °C )	UUC Reading ( °C )	Temperature Stability ( ± °C )	Temperature Uniformity ( °C )	Overall Variation ( °C )
80	80.0	80.0	0.24	0.38	0.38

- UUC = Unit Under Calibration

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

... End ...



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



## Certificate of Calibration

Cert.No.: 24CH1295

Page.: 1 of 3

Equipment : pH Meter  
Manufacturer : Hach  
Model : HQ411d  
Serial No. : 200100031163  
ID No. : BKK\_EN0342  
Condition As-Received: Used Item  
Received Date : 16 October 2024  
Calibration Date : 17 October 2024  
Reference : 2410-0548DSC-5  
Submitted by :

REVIEW BY

*Jinda K*

APPROVED BY

*Siriluk P*

NEXT CAL DATE

17/10/25

Ambient Temperature : (25 ± 2.5) °C  
Relative Humidity : (50 ± 15) %  
Calibration Procedure : In - house method :  
- CP-CH5 by direct measurement with  
certified reference material (CRM)  
- CP-CH8 by comparison with temperature standard

Calibrated by : Warakorn Lernagtrakul

Approved by :

*Saithip*

Approved Signatory

- ( ) Unnopphol Harachai  
( ) Ponpan Paipim  
(✓) Saithip Meangmai

Issue Date : 21 October 2024

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

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Approval of the head of Corporate Services 3 : Equipment Calibration and Testing Services.



Cert.No.: 24CH1295

Page.: 2 of 3

**Condition of this calibration result**

1. Reference Standard Instrument

<u>Instrument</u>	<u>Serial No.</u>	<u>ID No.</u>	<u>Cert. No.</u>	<u>Due Date</u>
1)Ref. Standard Thermometer	2188080	130RC044	24I1022	16 Sep 2025

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

2. Certified Reference Materials :The measurement results are traceable to SI through Hach Lenge GmbH Ltd.  
Deutsche Akkreditierungsstelle, Accredited No.D-RM-15184-01-00  
:The measurement results are traceable to SI through CPA chem Ltd.,  
ANSI-ASQ National Accreditation Board, Accredited No. AR-1835

<u>Buffer Solution</u>	<u>Manufacturer</u>	<u>Lot No.</u>	<u>Exp. date</u>
pH 4.008	CPA chem	1034203	27 Sep 2026
pH 6.999	Hach Lenge GmbH	C03145	28 Feb 2026
pH 10.010	CPA chem	1034205	27 Sep 2025

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

**Calibration Results**

**Function : pH Measurement**

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

<u>Unit Under Calibration</u>	<u>Standard pH Buffer Solution</u>	<u>Actual pH Reading</u>	<u>Actual mV Reading (mV)</u>	<u>Uncertainty of pH Measurement (±)</u>	<u>Coverage factor k</u>
pH Electrode S/N.: 230473042902	4.008	4.028	174.6	0.0044	2.00
	6.999	7.014	1.4	0.0084	2.05
	10.010	10.018	-172.8	0.0066	2.00

**Remark** - Can not connect the BNC because the plug does not match with the socket.





Cert.No.: 24CH1295

Page.: 3 of 3

### **Calibration Results**

#### **Function : Temperature Measurement**

#### **( \* ) Without adjustment**

This equipment was connected with Temperature Probe;

- Model : PHC281  
- Serial No. : 230473042902

Dimension of probe

- Length : 103 mm.  
- Diameter : 12 mm.  
- Immersion Depth : 90 mm.

Calibration Point ( °C )	Standard Temperature ( °C )	UUC* Reading ( °C )	Error ( °C )	Uncertainty of measurement ( ± °C )	Coverage factor <i>k</i>
25.0	25.002	25.0	-0.002	0.13	2.00

**Remark : UUC\* = Unit Under Calibration**

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

-o0o-


**Agilent Technologies**

Agilent Technologies (Thailand) Limited  
U CHU LIANG BLDG. 22/F UNIT A,D  
968 RAMA 4 ROAD, SILOM, BANGRAK  
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Fax: +662 632 4334  
Email: [ccc-smt@agilent.com](mailto:ccc-smt@agilent.com)  
Website: [www.agilent.com/chem](http://www.agilent.com/chem)

**Customer Contact:**

ALS Laboratory Group (Thailand) Co  
Ltd  
Head Office  
104 Phatthanakan 40 Phatthanakan Rd  
Khwaeng Phatthanakan Khet Suan  
TAX ID : 0105540004859  
[Chanattagarn.lmchom@alsglobal.com](mailto:Chanattagarn.lmchom@alsglobal.com)  
27603068

**Invoice To:**

ALS Laboratory Group (Thailand) Co  
Ltd  
Head Office  
104 Phatthanakan 40 Phatthanakan Rd  
Khwaeng Phatthanakan Khet Suan

**Delivery Site:**

ALS Laboratory Group (Thailand) Co  
Ltd  
Head Office  
104 Phatthanakan 40 Phatthanakan Rd  
Khwaeng Phatthanakan Khet Suan

**Location:**

**Room**  
**Bldg**  
**Lab**  
**Dept**

**SERVICE REPORT**

<b>Customer Purchase Order Number:</b>	<b>Customer Number:</b> 70371013
<b>Service Request:</b>	<b>Service Request Date:</b>
<b>Service Order:</b> 6006041263	<b>Service Confirmation:</b> 6905338201

REVIEW BY	Supakwan N.
APPROVED BY	Savitri N.
NEXT CAL. DATE	13/06/2025

**Direct Inquiries to:**

Contact Name: Customer Contact Center  
Contact E-mail: [ccc-smt@agilent.com](mailto:ccc-smt@agilent.com)  
Contact Telephone: +662 637 6363  
Contact Fax: +662 632 4334

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U Chu Liang Bldg. 22/F Unit A,D  
968 Rama 4 Road, Silom, Bangrak,  
Bangkok 10500 Thailand  
Tax ID : 0105542068218

Citibank N.A. Bangkok Branch  
399 Interchange 21 Building, Sukhumvit Road, Klongtoey Nau  
Sub-district, Wattana District, Bangkok 10110 Thailand  
Acc. No: 012-4452-007 ,  
THB:Krung Thai Bank PCL  
Siam Square Br.,416/1-2 Rama I Rd.,Pathumwan, BKK 10330  
Thailand

ORIGINAL

**Service Confirmation Number:** 6905338201

**Service Confirmation Date:** 12.12.2023

**Service Instrument:**

Model Number	Model Description	Serial Number	System Handle	Parent Asset
SYS-IM-7700-E	ICPMS 7700 System Enhanced		ICP MS 7700 (HPLC)	
G1316A	1260 Thermostatted Column Compartment	DEACN12300	ICP MS 7700 (HPLC)	SYS-IM-7700-E
G1329B	1260 Standard Autosampler	DEAAC11098	ICP MS 7700 (HPLC)	SYS-IM-7700-E
G1311B	1260 Quaternary Pump	DEAB704380	ICP MS 7700 (HPLC)	SYS-IM-7700-E
G3281A	Agilent 7700x ICP-MS	JP12091612	ICP MS 7700 (HPLC)	SYS-IM-7700-E

**Service Items:**



Item	Service/Part #	Description	Qty	Entitlement	Service Start	Service End
1000	EOQ	Enterprise Operational Qualification	1.00	Agreement Entitlement - 100 % covered	12.12.2023	12.12.2023
1010	5185-5850	ICP-MS Checkout Solutions	1.00	Agreement Entitlement - 100 % covered		

**Additional Information:**

Service Confirmation Number: 6905338201

Service Confirmation Date: 12.12.2023

**Service Information:**

<b>Problem Description:</b> WU-OQ-IM/HPLC-7700-5001143313		
<b>Service Provided:</b> Perform OQ Hardware control test CSD logon, Autosample , ISIS , Auto tune , BG and Stability. After done the instrument BKK_EL0026 calibrated pass all.		
<b>Service Overview Code:</b> Reason Code: Scheduled Service Diagnosis Code: Scheduled Service Resolution Code: Scheduled Service		
<b>Reported Hours:</b> 6.0	<b>Travel Hours:</b> 1.0	
<b>Customer Field Service Representative Name:</b> Panthep Kurasathain	<b>Customer Field Service Representative Signature:</b> 	<b>Date:</b> 12 Dec 2023
<b>Customer Name:</b> Supakwan Mak	<b>Customer Signature:</b> 	<b>Date:</b> 12 Dec 2023
<b>Additional Comments:</b>		

Certificate No. T231676

Page 1 of 6

**Certificate of Calibration****Equipment : HEATING BLOCK****Manufacturer : Environmental Express****Model : SC 196****Serial No. : 6974CECW3285****Customer Code : BKK\_EL0054****ID No. : T5306A3****Customer : ALS Laboratory Group (Thailand) Co.,Ltd.**

104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan,

Khet Suan Luang, Bangkok 10250

**Customer Location : Acid Digestion Lab****Date of Receipt : 13 September 2023****Calibrated By : Sanee Musikawan ( Site Calibration Manager )****Approved By :  / Sujjar Naknakred ( Site Calibration Manager )****Date of Issue : 26 SEP 2023**

REVIEW BY	Tattaporn C.
APPROVED BY	Saenit N.
NEXT CAL. DATE	22/03/25

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

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



Certificate No. T231676

Page 2 of 6

## Calibration Report

**Equipment** : HEATING BLOCK  
**Date of Calibration** : 22 September 2023  
**Environment** : Temperature : 21.8-23.1 °C  
Line Voltage : 221.6-226.3 V  
Relative Humidity : 55 - 65 %RH

### Condition of this results of calibration :

1. This equipment was calibrated by insert 20 standard thermocouples type T into its chamber , the other one standard thermocouples type T use for ambient temperature measurement . The calibration was done in according to WI-T20.

All data show below were final values and the initial data from customer request . The temperature scale used was based on ITS - 90 .

2. Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
TC	TYPE T	TN21-TN30	T230014	17 January 2024
TC	TYPE T	TN31-TN40	T230014	17 January 2024
DATA LOGGER	34970A	T151	T230014	17 January 2024

3. This certificate is traceable to :

National Institute of Metrology ( Thailand ) through Metrological Center ( NSC-TISI-TIS 17025 CALIBRATION 0244.)

4. Condition of calibrated item : good

Equipment Description :

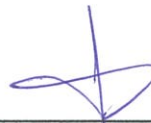
Time Constant 2 Hour 20 Minute At 95 °C  
Fresh Air Damper ☐ Open ☐ Min ☐ Medium ☐ Max  
☐ Close  
☒ Not Available

5. Adjustment :

( ) without adjustment

( X ) after adjustment

Approved By \_\_\_\_\_





# Metrological Center

## SCI ECO Services Company Limited

33/2 Moo 3, T.Banpa, A.Kaengkhoi, Saraburi 18110

Telephone : +66 2 586 5792-4 Fax : +66 2 586 5109

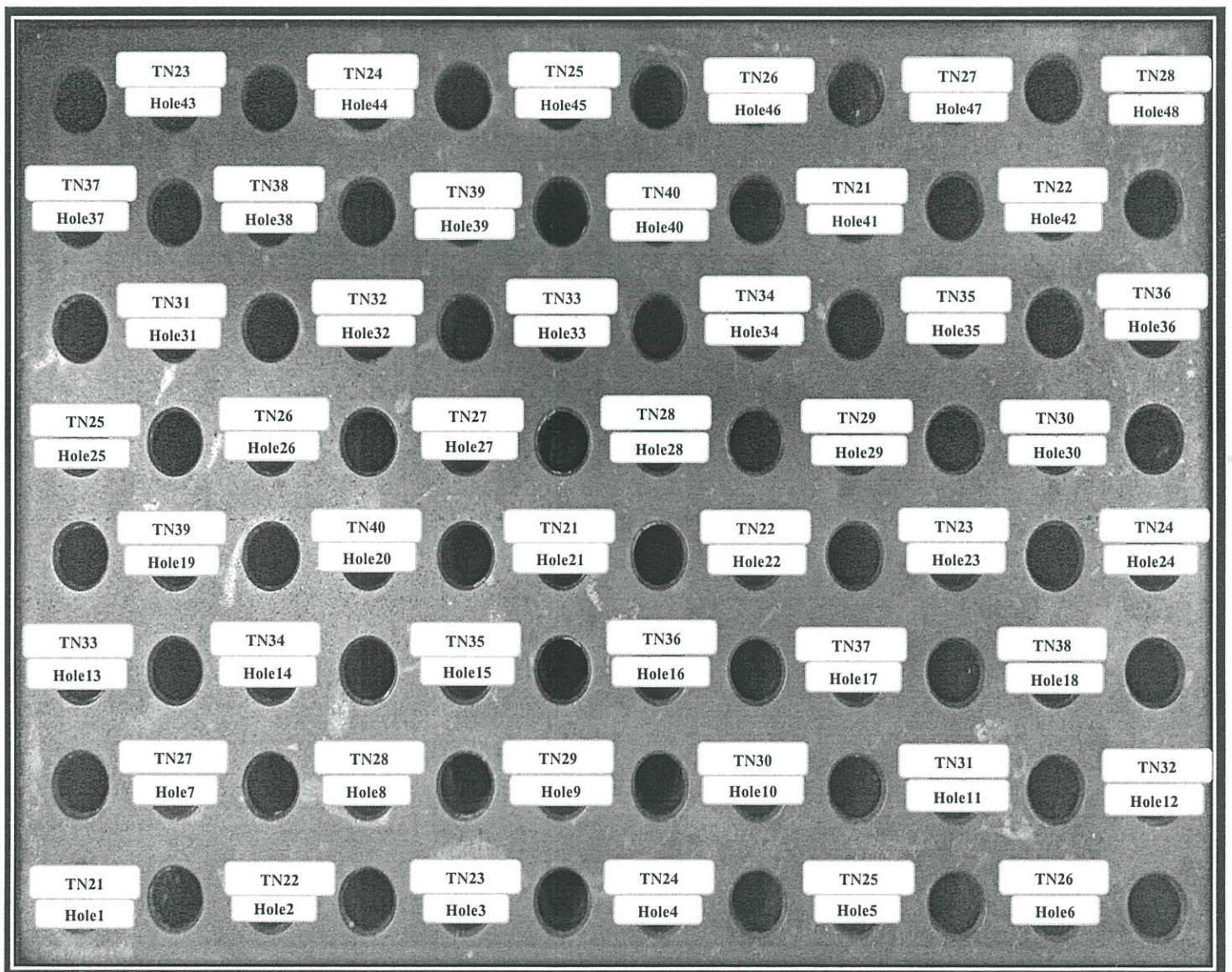
Website : [www.scieco.co.th](http://www.scieco.co.th)

E-Mail : [calibrate@scg.co.th](mailto:calibrate@scg.co.th)

Certificate No. T231676

Page 3 of 6

## Calibration Report



FRONT CONTROL

Approved By. \_\_\_\_\_



Certificate No T231676

Page 4 of 6

## Calibration Report

### Measurement Results

Calibration Point		Average Standard Reading at each position ( ° C )					
<b>R1 Hole1-Hole6</b>		<b>TN21</b>	<b>TN22</b>	<b>TN23</b>	<b>TN24</b>	<b>TN25</b>	<b>TN26</b>
CAL POINT	Max	95.01	94.41	95.20	95.41	94.51	95.17
95	Min	94.57	93.95	94.75	94.92	94.00	94.72
	Average	94.79	94.18	94.98	95.17	94.26	94.95
<b>R2 Hole7-Hole12</b>		<b>TN27</b>	<b>TN28</b>	<b>TN29</b>	<b>TN30</b>	<b>TN31</b>	<b>TN32</b>
	Max	95.36	95.43	95.19	95.16	95.35	94.97
	Min	94.94	94.95	94.72	94.71	94.90	94.57
	Average	95.15	95.19	94.96	94.94	95.13	94.77
<b>R3 Hole13-Hole18</b>		<b>TN33</b>	<b>TN34</b>	<b>TN35</b>	<b>TN36</b>	<b>TN37</b>	<b>TN38</b>
	Max	95.37	95.50	95.22	95.21	95.33	95.31
	Min	94.99	95.09	94.78	94.82	94.88	94.96
	Average	95.18	95.30	95.00	95.02	95.11	95.13
<b>R4 Hole19-Hole24</b>		<b>TN39</b>	<b>TN40</b>	<b>TN21</b>	<b>TN22</b>	<b>TN23</b>	<b>TN24</b>
	Max	95.59	94.42	94.52	94.24	94.63	94.67
	Min	95.21	94.06	94.13	93.88	94.28	94.27
	Average	95.40	94.24	94.33	94.06	94.45	94.47
<b>R5 Hole25-Hole30</b>		<b>TN25</b>	<b>TN26</b>	<b>TN27</b>	<b>TN28</b>	<b>TN29</b>	<b>TN30</b>
	Max	95.19	95.38	92.93	95.30	95.14	95.03
	Min	94.83	95.03	92.56	94.95	94.79	94.70
	Average	95.01	95.20	92.75	95.12	94.96	94.87
<b>R6 Hole31-Hole36</b>		<b>TN31</b>	<b>TN32</b>	<b>TN33</b>	<b>TN34</b>	<b>TN35</b>	<b>TN36</b>
	Max	94.63	94.90	94.77	94.31	94.24	93.87
	Min	94.24	94.55	94.44	93.98	93.92	93.56
	Average	94.43	94.72	94.60	94.14	94.08	93.71
<b>R7 Hole37-Hole42</b>		<b>TN37</b>	<b>TN38</b>	<b>TN39</b>	<b>TN40</b>	<b>TN21</b>	<b>TN22</b>
	Max	94.30	94.44	94.04	93.81	94.89	95.35
	Min	93.95	94.05	93.67	93.48	94.39	94.90
	Average	94.13	94.24	93.86	93.65	94.64	95.12
<b>R8 Hole43-Hole48</b>		<b>TN23</b>	<b>TN24</b>	<b>TN25</b>	<b>TN26</b>	<b>TN27</b>	<b>TN28</b>
	Max	95.99	95.63	95.28	95.29	95.45	94.87
	Min	95.57	95.15	94.82	94.84	94.99	94.48
	Average	95.78	95.39	95.05	95.07	95.22	94.68

Approved By. \_\_\_\_\_



Certificate No T231676

Page 5 of 6

## Calibration Report

### Measurement Results

Calibration Point		Average Standard Reading at each position ( ° C )					
<b>R1 Hole1-Hole6</b>		<b>TN21</b>	<b>TN22</b>	<b>TN23</b>	<b>TN24</b>	<b>TN25</b>	<b>TN26</b>
CAL POINT	Max	105.23	104.32	105.43	105.25	104.44	105.27
105	Min	104.94	103.95	105.15	105.04	104.11	104.96
	Average	105.09	104.13	105.29	105.15	104.28	105.12
<b>R2 Hole7-Hole12</b>		<b>TN27</b>	<b>TN28</b>	<b>TN29</b>	<b>TN30</b>	<b>TN31</b>	<b>TN32</b>
	Max	105.30	105.12	105.18	105.22	105.12	105.16
	Min	105.11	104.92	104.96	105.00	104.92	104.97
	Average	105.20	105.02	105.07	105.11	105.02	105.06
<b>R3 Hole13-Hole18</b>		<b>TN33</b>	<b>TN34</b>	<b>TN35</b>	<b>TN36</b>	<b>TN37</b>	<b>TN38</b>
	Max	105.37	105.63	105.02	104.80	104.69	105.19
	Min	105.17	105.37	104.75	104.59	104.50	105.00
	Average	105.27	105.50	104.88	104.69	104.60	105.09
<b>R4 Hole19-Hole24</b>		<b>TN39</b>	<b>TN40</b>	<b>TN21</b>	<b>TN22</b>	<b>TN23</b>	<b>TN24</b>
	Max	105.31	104.43	106.41	104.71	105.63	105.82
	Min	105.08	104.22	106.15	104.41	105.37	105.56
	Average	105.19	104.33	106.28	104.56	105.50	105.69
<b>R5 Hole25-Hole30</b>		<b>TN25</b>	<b>TN26</b>	<b>TN27</b>	<b>TN28</b>	<b>TN29</b>	<b>TN30</b>
	Max	104.95	106.26	103.34	105.78	105.59	105.87
	Min	104.67	105.96	103.08	105.56	105.36	105.68
	Average	104.81	106.11	103.21	105.67	105.48	105.77
<b>R6 Hole31-Hole36</b>		<b>TN31</b>	<b>TN32</b>	<b>TN33</b>	<b>TN34</b>	<b>TN35</b>	<b>TN36</b>
	Max	104.75	104.86	104.80	105.20	104.50	104.39
	Min	104.54	104.63	104.59	105.00	104.32	104.18
	Average	104.65	104.75	104.69	105.10	104.41	104.28
<b>R7 Hole37-Hole42</b>		<b>TN37</b>	<b>TN38</b>	<b>TN39</b>	<b>TN40</b>	<b>TN21</b>	<b>TN22</b>
	Max	104.30	104.90	104.85	104.65	104.88	104.85
	Min	104.09	104.72	104.66	104.49	104.63	104.52
	Average	104.19	104.81	104.75	104.57	104.76	104.68
<b>R8 Hole43-Hole48</b>		<b>TN23</b>	<b>TN24</b>	<b>TN25</b>	<b>TN26</b>	<b>TN27</b>	<b>TN28</b>
	Max	105.71	105.85	105.39	105.61	105.42	105.19
	Min	105.45	105.61	105.14	105.27	105.18	104.94
	Average	105.58	105.73	105.27	105.44	105.30	105.07

Approved By. \_\_\_\_\_





Certificate No. T231676

Page 6 of 6

## Calibration Report

### Measurement Results:

HEATING BLOCK			Temperature Distribution	
Setting ( °C )	Reading ( °C )		Stability ( ± °C )	Uncertainty ( ± °C )
	Min , Max	Average		
100.0	100.3 , 100.5	100.4	0.26	0.81
107.0	107.0 , 107.1	107.1	0.19	0.78

\* The quoted uncertainty exclude " uniformity "

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on date and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k$  which for a t-distribution, providing a level of confidence of approximately 95 % .

Approved By. \_\_\_\_\_





# Metrology

SCI ECO Services Company Limited

33/2 Moo 3, T.Banpa, A.Kaengkhoi, Saraburi 18110, Thailand.

Saraburi Tel : +66 3627 3096 Fax : +66 3627 3100

Bangkok Tel : +668 9205 6851 , +669 8247 2360

Website : www.scieco.co.th E-Mail : calibrate@scg.com



Certificate No. T232160

Page 1 of 4

## Certificate of Calibration

Equipment : Chamber ( Cooling Room )

Manufacturer : KOLDTECH

Model : KM 320

Serial No. : TBN-1012061/05

Customer Code : BKK\_EN0167

ID No. : T2463A3

Customer : ALS Laboratory Group (Thailand) Co.,Ltd.

104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan,

Khet Suan Luang, Bangkok 10250

Customer Location : Laboratory

Date of Receipt : 29 November 2023

Calibrated By : Atiphong Rongrat ( Technician )

Approved By : Boonchai Suriyawong / Boonchai Suriyawong (Site Calibration Manager)

Date of Issue : 09 JAN 2024

REVIEW BY	<u>Kank Auk</u>
APPROVED BY	<u>Siriluk P.</u>
NEXT CAL. DATE	<u>06/06/25</u>

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

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

Certificate No. T232160

Page 2 of 4

## Calibration Report

**Equipment** : Chamber ( Cooling Room )  
**Date of Calibration** : 6 December 2023  
**Environment** : Temperature : 23.4-24.9 °C  
Line Voltage : 221.4-230.2 V  
Relative Humidity : 55 - 65 %RH

### Condition of this results of calibration :

1. This equipment was calibrated by insert 16 standard thermocouples type T into its chamber , the other one standard thermocouples type T use for ambient temperature measurement . The calibration was done in according to WI-T20 ( based on ASTM E145-94 ( Reapproved 2001) and AS2853-1986 ).  
All data show below were final values and the initial data from customer request . The temperature scale used was based on ITS - 90 .

2. Reference Standard Instrument :

Instrument	Model	Instrument No.	Certificate No.	Due Date
TC	TYPE T	TN161-TN170	T230773	10 April 2024
TC	TYPE T	TN171-TN180	T230773	10 April 2024
DATA LOGGER	34970A	T149	T230773	10 April 2024

3. This certificate is traceable to :

National Institute of Metrology ( Thailand ) through Metrological Center ( NSC-TISI-TIS 17025 CALIBRATION 0244.)

4. Condition of calibrated item : good

Equipment Description :

Time Constant 1 Hour 30 Minute At 3 °C  
Fresh Air Damper ☐ Open ☐ Min ☐ Medium ☐ Max  
☐ Close  
☒ Not Available

5. Adjustment :

( X ) without adjustment

( ) after adjustment

Approved By. 



Certificate No. T232160

Page 4 of 4

## Calibration Report

### Measurement Results

Calibration Point	Average Standard Reading at each position (°C)											
	TN161	TN162	TN163	TN164	TN165	TN166	TN167	TN168	TN169	TN170	TN171	TN172
3.0	2.83	3.34	2.95	3.46	3.45	3.76	3.25	3.46	3.39	3.50	3.58	3.42
	TN173	TN174	TN175	TN176								
	3.33	3.39	3.15	3.43								

Chamber ( Cooling Room )			Temperature Distribution				
Setting (°C)	Reading (°C)		Average (°C)	Stability (± °C)	Uniformity (°C)	Uncertainty (± °C)	Coverage Factor <i>k</i>
	Min , Max	Average					
3.0	2.8 , 4.1	3.5	3.36	1.10	2.00	1.90	2.09

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on date and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* which for a t-distribution, providing a level of confidence of approximately 95 % .

Approved By. 



**Scientist  
Instrument**

REVIEW BY	<i>Chanatt S.</i>
APPROVED BY	<i>Sauntan N.</i>
NEXT CAL. DATE	<i>6/12/24</i>

## Performance Verification Certificate for Mercury Analyzer

**PRODUCT ID** *Quicktrace M-8000 , Teledyne Leeman Labs*

**Equipment ID** *BKK\_EL0128 Mercury Analyzer  
S/N: US22133002*

*BKK\_EL0129 Autosampler  
S/N : 052222A560*

**Customer Name** *ALS Laboratory Group (Thailand) Co., Ltd.*

**Address** *104 Soi Pattana 40, Pattana Rd. Suan Luang, Suan Luang  
Bangkok 10250 Thailand*

**Date of Qualified** *December 6, 2023*

**Next Due date** *December 6, 2024*

This certifies for products which was performed in acceptable criteria specifications

<b>Autosampler &amp; Sample Introduction</b>	<b>PASSED</b>
<b>Analyzer</b>	<b>PASSED</b>
<b>Gas Liquid Separator &amp; Dryer</b>	<b>PASSED</b>
<b>CVAFS Detector</b>	<b>PASSED</b>
<b>Electronics/Mechanical</b>	<b>PASSED</b>
<b>Data station/PC</b>	<b>PASSED</b>
<b>Analytical test</b>	<b>PASSED</b>

**Provided by**

**Scientist Instrument Co.,Ltd.**  
113 Soi Ekachai 44, Ekachai Road  
Khleng Bang Phran, Bangbon  
Bangkok 10150 Thailand

**Certified by** *Thunraphol Sakdayos*  
**Thunraphol Sakdayos**

**Service Engineer**



**Sartorius (Thailand) Co., Ltd.**

129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310

Tel: +66 2643 8361-6 , e-mail: service.thailand@sartorius.com



NSC-TIS-TIS 17025

CALIBRATION 0426

**SARTORIUS**

REVIEW BY

Jinda K

APPROVED BY

Siriluk P

NEXT CAL DATE

02/08/25

# Certificate

## of Calibration

Model Number : MSE224S-100-DU

Description : Analytical Balance

Serial Number : 0027405555

ID No. : BKK\_EN0003

Manufacturer : Sartorius

Certificate No. : 24BCI0270

Issued Date : Monday, August 05, 2024

Reference No. : 240942

Page No. : 1 of 2

Customer Name : ALS Laboratory Group (Thailand)Co., Ltd.

104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Suan Luang, Khet Suan Luang, Bangkok 10250.

Calibrated Place : Lab Room

Calibrated By : Mr.Chonchai Inthana

Calibration Date : Friday, August 02, 2024

**Calibration**

Procedure No. : This calibration was conducted by

Using in-house calibration procedure number (WI-003)

Based on UKAS LAB 14 : 2019

**Metrological data :**

Capacity : 220 g Readability : 0.0001 g

**Ambients Conditions:**

Temperature : 23.0 °C ± 5.0 °C

Humidity : 55.0 % RH ± 10.0 % RH

Pressure : ±

**Reasons for calibration**☒ New Installation ☐ Service / Repaired ☒ Re-calibration/ Maintenance**Equipment Condition:** ☒ Good Operate ☐ Fair**Measurement Method****UKAS Publication Ref :Lab 14**

The measurement uncertainty stated is the expended uncertainty which is obtained from the standard uncertainty multiplied by the coverage factor ( $k=2$ ) to provide a level of confidence of approximately 95%. It is determined in accordance with the Guide to Expression of Uncertainty in Measurement (GUM). The calibration certificate documents the traceability to National Standards, which realise the unit of measurement according to the International Standard System of Units (SI). Report of Tolerance came from list of Sartorius Metrological Specifications.

**Traceability:**

Model Number	Description	Traceability	Certificate No.	Due Date
YCS011-522-00	Sartorius weight set 1mg - 5000g E2,YCS011-522-00	TCS	M23081975	23-Aug-2025
Testo 174 H	Thermo-Hygrometer , Testo 174H	ENTECH	H/T 661303,H661140	12-Nov-2024

This certificate relate and apply this equipment only.

This certificate may not be reproduced other than in full except with the prior written approval of the Verification Operation Division Sartorius (Thailand) Co., Ltd.

Mr.chonchai Inthana(Technical Manager)

S  
T  
A  
M  
P

**Sartorius (Thailand) Co., Ltd.**

129 Rama 9 Road, Huaykwang, Huaykwang, Bangkok 10310

Tel: +66 2643 8361-6 Fax: +66 2643-8367, e-mail: service.thailand@sartorius.com

**SARTORIUS**

# Certificate of Calibration

Model Number : MSE224S-100-DU

Description : Analytical Balance

Serial Number : 0027405555

ID No. : BKK\_EN0003

Manufacturer : Sartorius


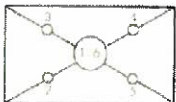
Certificate No. : 24BCI0270

Issued Date : Monday, August 05, 2024

Reference No. : 240942

Page No. : 2 of 2

## Calibration Results : Without Adjustment

Repeatability			Eccentricity (Off-center loading error)		
<i>The reproducibility is the ability of a weighing instrument to display nearly identical readouts under constant test conditions when the same load within a measurement series is placed repeatedly on the weighing pan in the same manner. The standard deviation is used to express reproducibility quantitatively.</i>			<i>The off-center loading error is yielded by the difference between the readout of the load, i.e. 1/3 or 1/4 of maximum capacity, placed in the middle of the weighing pan and between each of four additional measurement points (positions defined according to OIML R76).</i>		
Nominal Value : (Low Load)	20.0000	200.0000	Nominal value :	100	g
20 g	20.0000	199.9999	Tolerance	0.0004	g
Tolerance	20.0001	200.0000		Difference	
0.0001 g	20.0000	200.0000		1	-
Nominal Value : (High Load)	20.0000	200.0000		2	0.0000
200 g	20.0001	200.0001		3	0.0000
Tolerance	20.0000	200.0000		4	0.0000
0.0001 g	20.0000	199.9999		5	0.0001
	20.0000	200.0000	6	-	
Standard Deviation	0.00004	0.00006			
<b>Linearity</b>					
<i>The linearity, also called linearity error. Describes the deviation of the characteristic curve of a weighing instrument from the linear slope.</i>					
Tolerance 0.0002 g					
Nominal Value	Conventional Mass Value	Displayed Value	Deviation	Uncertainty	
(g)	(g)	(g)	(g)	(g)	
0.01	0.0100	0.0100	0.0000	0.00015	
0.1	0.1000	0.1000	0.0000	0.00015	
1	1.0000	1.0000	0.0000	0.00015	
2	2.0000	2.0000	0.0000	0.00015	
5	5.0000	5.0000	0.0000	0.00015	
10	10.0000	10.0000	0.0000	0.00015	
20	20.0000	20.0000	0.0000	0.00015	
50	50.0000	50.0001	0.0001	0.00016	
100	100.0000	100.0001	0.0001	0.00019	
200	200.0000	200.0000	0.0000	0.00029	
End of Report.					

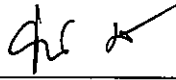
Certificate No. T240904

Page 1 of 3

**Certificate of Calibration****Equipment** : Chamber ( Oven )**Manufacturer** : Memmert**Model** : UF 450**Serial No.** : B717.0531**Customer Code** : BKK\_EN0273**ID No.** : T8042A4**Customer** : ALS Laboratory Group (Thailand) Co.,Ltd.

104 Phatthanakan 40, Phatthanakan Rd., Khwaeng Phatthanakan,

Khet Suan Luang, Bangkok 10250

**Customer Location** : Laboratory (Oven Room)**Date of Receipt** : 08 May 2024**Calibrated By** : Preecha Phisassutthikul ( Temperature Calibration Manager )**Approved By** :  / Nuafun Sungchum (Metrology Manager)**Date of Issue** : 23 MAY 2024

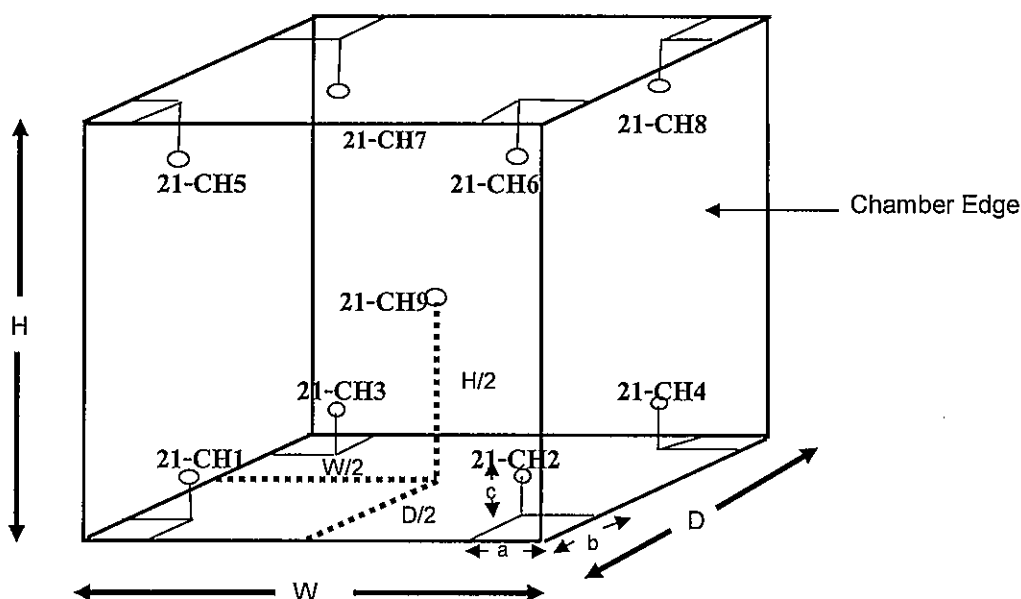
REVIEW BY	<i>finda k</i>
APPROVED BY	<i>Siriluk P.</i>
NEXT CAL. DATE	14/11/25

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

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



## Calibration Report



**Remark :**

Internal Dimensions of Chamber : W (Width) = 104 cm. , H(Height)=72 cm. and D(Depth)=60 cm.  
 Size of Installed Standard sensor number 21-CH1 to number 21-CH8 : a = 5 cm. , b = 5 cm. and c = 5 cm.  
 Size of Installed Standard sensor number 21-CH9 : W/2=104 cm./2 , H/2=72 cm./2 and D/2=60 cm./2

**Measurement Results**

Calibration Point	Average Standard Reading at each position (°C)								
	21-CH1	21-CH2	21-CH3	21-CH4	21-CH5	21-CH6	21-CH7	21-CH8	21-CH9
104	103.4	105.0	103.7	103.6	103.3	104.6	103.3	104.0	103.9
180	179.5	181.1	179.2	179.5	179.0	181.3	179.8	179.9	180.2

Chamber ( Oven )			Temperature Distribution				
Setting (°C)	Reading (°C)		Average (°C)	Stability (± °C)	Uniformity (°C)	Uncertainty (± °C)	Coverage Factor <i>k</i>
	Min , Max	Average					
104.0	103.9 , 104	104.0	103.85	0.14	1.27	0.44	2.00
180.0	179.9 , 180.1	180.0	179.94	0.39	2.29	0.76	2.00

\* The quoted uncertainty exclude "uniformity"

The calibration result apply only the above calibrated item.

The result of test was found accurate as shown on date and place of test only.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor *k* which for a t-distribution, providing a level of confidence of approximately 95 % .

End of Certificate

Approved By. 



ภาคผนวก จ

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สำเนาหนังสืออนุญาตขึ้นทะเบียน  
ห้องปฏิบัติการวิเคราะห์เอกชน



ที่ อก ๐๓๑๐(๑)/ ๑๖๑๖๘

กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๕๐๐

## ๒๐ พฤศจิกายน ๒๕๖๖

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๔ สิงหาคม ๒๕๖๖

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

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุหนังสือ  
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน 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 ๑๘๑ ราย ตามสิ่งที่ส่งมาด้วย ๒  
ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสีย น้ำใต้ดิน อากาศเสีย สิ่งปฏิกูล  
หรือวัสดุที่ไม่ใช่แล้ว และดิน ตามสิ่งที่ส่งมาด้วย ๓

หนังสือฉบับนี้จะหมดอายุในวันที่ ๒ กันยายน ๒๕๖๙ หากประสงค์จะต่ออายุหนังสือ  
รับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อ  
กรมโรงงานอุตสาหกรรม ภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายศิระ จันทรเจ็ด)

นักวิทยาศาสตร์เชี่ยวชาญ รักษาการแทน  
ผู้อำนวยการกองวิจัยและเตือนภัยมลพิษโรงงาน  
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๙๙

ไปรษณีย์อิเล็กทรอนิกส์ saraban@diw.mail.go.th



เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๐๔  
ที่ อก ๐๓๑๐(๑)/ ๑๖๑๖๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์ จำนวน ๖ ราย

- |                                |                            |
|--------------------------------|----------------------------|
| ๑) นางสาวยุพาพร จันทรเปล่ง     | ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๑ |
| ๒) นางสาวชนันย์ โกมารกุล ณ นคร | ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๒ |
| ๓) นายศรายุทธ จิตรานนท์        | ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๓ |
| ๔) นางสาวกนกกร เอนก            | ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๔ |
| ๕) นายสุริยา สอนแก้ว           | ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๕ |
| ๖) นายวิชาญ ชุณหะวัณ           | ทะเบียนเลขที่ ว-๒๐๔-ค-๐๐๐๖ |

3/11/16

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๐๔  
ที่ ออก ๐๓๑๐(๑)/ ๑๖๑๖๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๑๘๑ ราย

๑) นายกาจบัณฑิต กิตติศุภวณิชช์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๑
๒) นายภัทรพล สว่างใจธรรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๒
๓) นายณราธิป เทือกชัยคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๓
๔) นายศิริโชค พงษ์ประสม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๔
๕) นายณัฐวุฒิ ดั่งแพง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๕
๖) นางสาวจินดา ไชจุลธรรม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๖
๗) นางสาวสาวิตรี น้อยเสงี่ยม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๗
๘) นางสาวชนัญญาญจน์ อิมขม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๘
๙) นางสาวนรินทร์ สายเส็ง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๐๙
๑๐) นางสาวนันทวดี สมบูรณ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๐
๑๑) นางสาวศรัณยา เฉลิมธำรงค์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๑
๑๒) นางสาวธัญญธร มงคลจิรวุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๒
๑๓) นางสาวศิริลักษณ์ บุนนาค	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๓
๑๔) นายณพพงศ์ จันทรพันธุ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๔
๑๕) นายนรเศรษฐ์ โกมลย์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๕
๑๖) นายธันวา จริยา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๖
๑๗) นางสาวเกศรินทร์ แก้วมัน	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๗
๑๘) นางสาวสุวิมล ชัยเรืองวุฒิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๘
๑๙) นางสาวสุชาดา ธรรมถาวร	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๑๙
๒๐) นางสาวเปมิกา ชัยเดชธนกุล	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๐
๒๑) นางสาวศศิธร หมูสวัสดิ์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๑
๒๒) นางสาวเสาวลักษณ์ ภู่นภาอำพร	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๒
๒๓) นายอภิสิทธิ์ สิงหา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๓
๒๔) นายศักดิ์สิทธิ์ ไพศาลพิสุทธิ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๔
๒๕) ว่าที่ร้อยตรีหญิง พรรณิภา ขำเจริญ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๕
๒๖) นางจิตดา คำภูแก้ว	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๖
๒๗) นางสาวอรรวรรณ รักยง	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๗
๒๘) นางสาวนพรัตน์ แยมกรานต์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๘
๒๙) นายจุลเดช วารินทร์	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๒๙
๓๐) นางสาวดาญรัตน์ ร้องคำ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๐
๓๑) นายพรมมี ศรีปัดเนตร	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๑
๓๒) นายอุทิศ อุ่นสิม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๒
๓๓) ว่าที่ร้อยตรี เฉลิมเกียรติ อมรศรีเสริม	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๓
๓๔) นางสาววริยา สร้างนา	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๔
๓๕) นายอนุพงศ์ รัตนศรีประเสริฐ	ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๕

วิมล

๓๖) นางสาวจุฑารัตน์...



๓๖) นางสาวจุฑารัตน์ โอนสันเทียะ  
๓๗) นางสาวจารุวรรณ พิมพ์ภักฤติยา  
๓๘) นางสาวปรารค์ทิพย์ กิจไพศาลศักดิ์  
๓๙) นางสาวเดือนใจ ทางกลาง  
๔๐) นางสาวจิราพร ศิริเวช  
๔๑) นายวรากร ผุ้รักษ์  
๔๒) นายทนง วิริยะสทกิจ  
๔๓) นายธนิต เจนจบ  
๔๔) นายคณิศร ข้าเพชร  
๔๕) นายภูวิช พรหมสะอาด  
๔๖) นายธนเดช โภคาพิพัฒน์  
๔๗) นายชวฤทธิ์ วงษ์จันทร์  
๔๘) นายอาทิตย์ ศรีแสน  
๔๙) นายเจษดินทร์ คงศักดิ์ไทย  
๕๐) นายจรัส บุญยั้ง  
๕๑) นายธนาณัติ เอนก  
๕๒) นายอภิวัฒน์ ทุมหนู  
๕๓) นางสาวสุภาขวัญ มาก  
๕๔) นางสาวทัตพร ขวาลสมบูรณ์  
๕๕) นางสาวธิดิมา บุญเพ็ง  
๕๖) นางสาวภาณุมาศ นามวัฒน์  
๕๗) นางสาวอุไรรัตน์ ทิ้งสร้างแป้น  
๕๘) นายธีรวัฒน์ ปวงสุข  
๕๙) นายอิทธิพล ยะโส  
๖๐) นายประพจน์ วรรณชูชัย  
๖๑) นายชยธร พวงทิพย์  
๖๒) นางสาวกนกวรรณ จันทบาล  
๖๓) นายสิทธิโชค ธงเงิน  
๖๔) นางศิวารวรรณ ใจบุญ  
๖๕) นางสาวพรรณธิดา พุ่มคง  
๖๖) นายนวกัทธ ศรีวิริยะ  
๖๗) นายสุวิชา ทองอ่อน  
๖๘) นายวิญญู บุญตะนัย  
๖๙) นายสมบูรณ์ บุตรจันทร์  
๗๐) นายวิรัตน์ ไชยนะรา  
๗๑) นายณฤเบศน์ เพิ่มพูน  
๗๒) นายจิรณัฐ ขาวละออ  
๗๓) นายอัสนี นามบุรี  
๗๔) นายอัครเวศ จ่อสาว

ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๓๖  
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ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๔

37/๗



๗๕) นายประเสริฐ สุระขันธ  
๗๖) นายบุญกุล จันทรเนียม  
๗๗) นายพิรพงษ์ ทองคุณปรีดา  
๗๘) นายณฤพล ทองนุช  
๗๙) นายอนุวัฒน์ ม่วงแพ  
๘๐) นายเจตศรวุฒิ ปัตตะมะ  
๘๑) นายกฤษณะ สายวรรณ  
๘๒) นายพิชัย บุญยงค์  
๘๓) นายภานุพงศ์ โยมวงศ์  
๘๔) นายสามารถ คุ่มปลี  
๘๕) นายสัญญาชัย โกศรีนาม  
๘๖) นายณัฐวุฒิ ศรีประเสริฐ  
๘๗) นายวัลลภ นาคพนม  
๘๘) นายพงศธร ชัยทิพย์  
๘๙) นายสิทธิโชค ทาสีดา  
๙๐) นายธนากร อินสุตา  
๙๑) นางสาววรรณิษา ขาติวันชัย  
๙๒) นางสาวพิมพ์ตะวัน มินากุล  
๙๓) นางสาวเพชรรัตน์ สิงห์สมบุญ  
๙๔) นางสาวชญานิน พรหมจันทร์  
๙๕) นายกীরติ ทวีราช  
๙๖) นายจักริน หมั่นวิชา  
๙๗) นายฉัตรชัย สุขเปีย  
๙๘) นายณรรนท เต๋ทองคำ  
๙๙) นายดุลยพล สนนอก  
๑๐๐) นายทักษ์ดนัย อุบลศรี  
๑๐๑) นายธนศร นามะภูณนา  
๑๐๒) นายธิตีพงศ์ บัวแดง  
๑๐๓) นายนนทชัย อุปถัมภ์  
๑๐๔) นายรัฐพล คุณสุทธิ  
๑๐๕) นายนันท์วัฒน์ สาริน  
๑๐๖) นายปิยะนัฐ พลมะศรี  
๑๐๗) นายพงศ์สิริ โสมเขียว  
๑๐๘) นายพีรพัฒน์ กำคำ  
๑๐๙) นายภาณุพงศ์ มานิตย์  
๑๑๐) นายมงคล ผลาทิพย์  
๑๑๑) นายสิรินันท์ ทองอ้น  
๑๑๒) นายอเนชา ทนสมัย  
๑๑๓) นายอดิศักดิ์ ผมไผ

ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๕  
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วิบูลย์

๑๑๔) นายอนันต์ชัย...

๑๑๔) นายอนันตชัย วีสม  
๑๑๕) นายวรวิฑูรย์ ดินัก  
๑๑๖) นายแสงตะวัน นตะสัด  
๑๑๗) นายยุทธพงศ์ รัตนะ  
๑๑๘) นายชัยวุฒิ ไชยชนะ  
๑๑๙) นายวิศรุต ศรีธรรมมา  
๑๒๐) นายมนทกร เผือกผ่อง  
๑๒๑) นายกำชัย สุทธะ  
๑๒๒) นางสาวณัฐภรณ์ บุญตะนัย  
๑๒๓) นางสาวพัชรินทร์ แสนสร้อย  
๑๒๔) นายไพโรจน์ เปี่ยมพิมาย  
๑๒๕) นางสาวศุภมาศ ทองมาก  
๑๒๖) นางสาวลลิตา จิตรสว่าง  
๑๒๗) นางสาวชไมพร เสิกภูเขียว  
๑๒๘) นางสาวกฤติมาพร คำมีแก่น  
๑๒๙) นางสาวสกุณรัตน์ ภาควง  
๑๓๐) นางสาวไพรินทร์ ศรีรูป  
๑๓๑) นางสาวทิพนันท์ ผุ่ยปัญญา  
๑๓๒) นางสาวสาธิตา ปานทอง  
๑๓๓) นางสาวอริสา ทองนวล  
๑๓๔) นางสาวอรยา คำคลอง  
๑๓๕) นางสาวชุตติภรณ์ สุนทรสนาน  
๑๓๖) นางสาวอัญชลี คำจันทร์  
๑๓๗) นายบุญฤทธิ์ เอี่ยมเทศ  
๑๓๘) นางสาวศุภรดา ปันมยุรา  
๑๓๙) นางสาวพาณดี คุณน่าน  
๑๔๐) นางสาวจิราเจต พองดา  
๑๔๑) นางสาวอารยา มีชัย  
๑๔๒) นางสาววิษุตา นาคผจญ  
๑๔๓) นางสาวนันทยา จันทะสุน  
๑๔๔) นายกิตติพงศ์ แซ่ลี  
๑๔๕) นายอนุวัติ ภูถวิล  
๑๔๖) นายธีรพล แสงทอง  
๑๔๗) นายศักดิ์พิพัฒน์ บุญมัน  
๑๔๘) นายฐิติวัตร เอมอุไร  
๑๔๙) นายชัยณรงค์ ศรีบุรินทร์  
๑๕๐) นางสาวอัจฉราวรรณ สอนสนอง  
๑๕๑) นางสาวณัฐพร สิงหา  
๑๕๒) นายภิรมเรศ แหยมโต

ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๑๔  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๑๕  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๑๖  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๑๗  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๑๘  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๑๙  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๒๐  
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ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๒๓  
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ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๒๖  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๒๗  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๒๘  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๒๙  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๐  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๑  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๒  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๓  
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ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๕  
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ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๔๗  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๔๘  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๔๙  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๐  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๑  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๒

31/10/2561

๑๕๓) นางสาวอุบล เคิกศิริ  
๑๕๔) นางสาวมโนรัตน์ ทองบุตร  
๑๕๕) นายภาคภูมิ แทนไทย  
๑๕๖) นางสาวสุภาณัฐ เมล์พวง  
๑๕๗) นางสาวพรทิวา สาตาชนม์  
๑๕๘) นายเอกวิทย์ วันทะนา  
๑๕๙) นายไตรมณฑล ทิพย์วรรณ  
๑๖๐) นายจิรเมธ ประเสริฐสิริพงศ์  
๑๖๑) นายจิรายุส เกษมสุข  
๑๖๒) นายจีรศักดิ์ ศรีวิชัย  
๑๖๓) นายณัฐกฤษณ์ สะพานแก้ว  
๑๖๔) นายบุญศักดิ์ ปะที  
๑๖๕) นายปิ่นณวิชัย เสมอทรัพย์  
๑๖๖) นายพิษณุพงษ์ ไชยา  
๑๖๗) นายภัทรพงษ์ มณฑาทอง  
๑๖๘) นายวสันต์ ตรีนกุล  
๑๖๙) นายภาณุเดช เพชรอุต  
๑๗๐) นายอนุกุล วิละแสง  
๑๗๑) นายภัทรพงษ์ มีสุข  
๑๗๒) นางสาวนุชวี ลีละทีป  
๑๗๓) นางสาวสุภาวดี โกศรีนาม  
๑๗๔) นางสาวอรณิข เทียนดำ  
๑๗๕) นางสาวพรเพ็ญ ขอบสอน  
๑๗๖) นางสาววันวิสา ขอนพิกุล  
๑๗๗) นางสาวอรรวรรณ เถาว์ทอง  
๑๗๘) นางสาวอัยย์ลิณ เมอร์วิณณ์  
๑๗๙) นางสาววิสรา คู่ยครอง  
๑๘๐) นายวุฒิกร ศิริวรรณ  
๑๘๑) นางสาวจารวรรณ กระจำพันธุ์

ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๓  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๔  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๕  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๖  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๕๗  
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ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๖๑  
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ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๖๔  
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ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๗๑  
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ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๗๕  
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ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๗๙  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๐  
ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๑

วิมล

เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๐๔

ที่ อก ๐๓๑๐(๑)/ ๑๖๑๖๘ ลงวันที่ ๒๐ พฤศจิกายน ๒๕๖๖

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๗๔ รายการ

น้ำเสีย จำนวน 60 รายการ

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

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
19	Copper	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
20	Cyanide	Distillation, Colorimetric Method <sup>[4]</sup>
21	2,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
22	4,4'-DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
23	2,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
24	4,4'-DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
25	2,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
26	4,4'-DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
27	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
28	Endosulfan Sulfate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
29	Endosulfan I	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
30	Endosulfan II	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
31	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
32	Endrin Aldehyde	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
33	Formaldehyde	Distillation, Colorimetric Method <sup>[3]</sup>
34	Free Chlorine	1) DPD Ferrous Titrimetric Method <sup>[4]</sup> 2) DPD Colorimetric Method <sup>[4]</sup>
35	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
36	Heptachlor Epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
37	Hexavalent Chromium	Colorimetric Method <sup>[4]</sup>
38	3-Hydroxycarbofuran	High-Performance Liquid Chromatographic Method <sup>[4]</sup>
39	Lead	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>



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

วิมล

น้ำใต้ดิน จำนวน 126 รายการ

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

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
18	Bis(2-ethylhexyl)phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
19	Bromodichloromethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
20	Bromoform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
21	Butanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
22	Butyl benzyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
24	Carbazole	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
25	Carbon disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
27	Chlordane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
28	p-Chloroaniline	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
32	2-Chlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
33	Chromium	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Colorimetric Method; Calculation <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Colorimetric Method; Calculation <sup>[4]</sup>
35	Chromium (VI)	Colorimetric Method <sup>[4]</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
36	Chrysene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
37	Cyanide	Distillation, Colorimetric Method <sup>[4]</sup>
38	2,4-D	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
39	DDD	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
40	DDE	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
41	DDT	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
42	Dibenz(a,h)anthracene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
43	Di-n-Butyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
47	3,3-Dichlorobenzidine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
53	2,4-Dichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>

3m2d

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
57	Dieldrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
58	Diethyl Phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
59	2,4-Dimethylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
60	2,4-Dinitrophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
61	2,4-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
62	2,6-Dinitrotoluene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
63	Di-n-octyl phthalate	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
64	Endosulfan	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
65	Endrin	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
67	Fluoranthene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
68	Fluorene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
69	Heptachlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
70	Heptachlor epoxide	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
71	Hexachlorobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
73	n-Hexane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
74	$\alpha$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
75	$\beta$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>

3/10/21



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
76	$\gamma$ -HCH	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
77	Hexachlorocyclopentadiene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
78	Hexachloroethane	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
79	Indeno(1,2,3-cd)pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
80	Isophorone	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
81	Lead	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
82	Manganese	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
83	Mercury	1) Digestion, Cold Vapor Atomic Absorption Spectrometric Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
84	Methanol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
85	Methoxychlor	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
86	Methyl bromide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
87	Methylene chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
88	2-Methylphenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
89	2-Methylnaphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
90	Methyl tert-butyl Ether	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
91	Naphthalene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
92	Nickel	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
93	Nitrobenzene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>

3mml

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
94	N-Nitrosodiphenylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
95	N-Nitrosodi-n-Propylamine	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
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 <sup>[4]</sup>
97	Pentachlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
98	pH	Electrometric Method <sup>[4]</sup>
99	Phenanthrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
100	Phenol	1) Distillation, Chloroform Extraction Method <sup>[4]</sup> 2) Distillation, Direct Photometric Method <sup>[4]</sup> 3) Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
101	Pyrene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
102	Selenium	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
103	Silver	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[4]</sup>
104	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
105	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
106	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
107	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
108	Toxaphene	Liquid-Liquid Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[4]</sup>
109	TPH (C <sub>5</sub> -C <sub>8</sub> )	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[14,25]</sup>

สมพงษ์

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
110	TPH (C <sub>8</sub> -C <sub>16</sub> )	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[9,22]</sup>
111	TPH (C <sub>16</sub> -C <sub>35</sub> )	Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic Method <sup>[9,22]</sup>
112	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
113	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
114	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
115	Trichloroethylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
116	2,4,5-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
117	2,4,6-Trichlorophenol	Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
118	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
119	Vanadium	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[4]</sup>
120	Vinyl acetate	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
121	Vinyl chloride	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
122	m-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
123	o-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
124	p-Xylene	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
125	Xylene (Total)	Purge and Trap, Gas Chromatographic/Mass Spectrometric Method <sup>[4]</sup>
126	Zinc	1) Digestion, Inductively Coupled Plasma Method <sup>[4]</sup> 2) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[4]</sup>

3/11/25

อากาศเสีย (ปล่อยระบาย) จำนวน 28 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
2	Arsenic	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup> 1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
3	Beryllium	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup> 1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
4	Cadmium	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup> 1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
5	Carbon Monoxide	1) Instrumental Analyzer Method <sup>[5]</sup> 2) Sampling Bag Non-Dispersive Infrared Method <sup>[5]</sup>
6	Chlorine	1) Absorption Sampling, Ion Chromatographic Method <sup>[5]</sup> 2) Isokinetic Sampling, Ion Chromatographic Method <sup>[5]</sup>
7	Chromium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup>
8	Cobalt	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup>
9	Copper	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup>
10	Cresol	Adsorption Sampling, Gas Chromatographic Method <sup>[5]</sup>
11	Dioxins	Isokinetic Sampling <sup>[5]</sup>
12	Hydrogen Chloride	1) Absorption Sampling, Ion Chromatographic Method <sup>[5]</sup> 2) Isokinetic Sampling, Ion Chromatographic Method <sup>[5]</sup>
13	Hydrogen Fluoride	1) Absorption Sampling, Ion Chromatographic Method <sup>[5]</sup> 2) Isokinetic Sampling, Ion Chromatographic Method <sup>[5]</sup>
14	Hydrogen Sulfide	Absorption Sampling, Iodometric Method <sup>[5]</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
15	Lead	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
16	Manganese	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup>
17	Mercury	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
18	Nickel	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup>
19	Opacity	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
20	Oxides of Nitrogen	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup>
21	Selenium	Ringelmann's Method <sup>[2]</sup>
22	Sulfur Dioxide	1) Absorption Sampling, Phenoldisulfonic Acid Method <sup>[5]</sup>
23	Sulfuric Acid	2) Absorption Sampling, Alkaline Permanganate/Colorimetric Method <sup>[5]</sup>
24	Tellurium	3) Instrumental Analyzer Method <sup>[5]</sup>
25	Tin	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
26	Total Suspended Particulate	2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup>
		1) Absorption Sampling, Barium-Thorin Titrimetric Method <sup>[5]</sup>
		2) Instrumental Analyzer Method <sup>[5]</sup>
		Isokinetic Sampling, Barium-Thorin Titrimetric Method <sup>[5]</sup>
		1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
		2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup>
		1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup>
		2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup>
		1) Isokinetic Sampling, Gravimetric Method <sup>[5]</sup>
		2) Paired Train, Isokinetic Sampling, Gravimetric Method <sup>[5]</sup>

3m



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
27	Vanadium	1) Isokinetic Sampling, Digestion, Inductively Coupled Plasma Method <sup>[5]</sup> 2) Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[5]</sup>
28	Xylene	Adsorption Sampling, Gas Chromatographic Method <sup>[5]</sup>

สิ่งปฏิกูลหรือวัสดุที่ไม่ใช้แล้ว จำนวน 35 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Aldrin	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,26]</sup>
2	Antimony	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,17]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,17]</sup>
3	Arsenic	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,17]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,17]</sup>
4	Barium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,17]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,17]</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
5	Beryllium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,17]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
6	Cadmium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,17]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
7	Chlordane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
8	Chromium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,17]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
9	Chromium (III)	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method; Waste Extraction, Colorimetric Method; Calculation Method <sup>[1,6,16,19]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method; Waste Extraction, Colorimetric Method; Calculation Method <sup>[1,6,17,19]</sup> 3) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method <sup>[7,8,16,19]</sup> 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method <sup>[7,8,17,19]</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
10	Chromium (VI)	1) Waste Extraction, Colorimetric Method <sup>[1,6,19]</sup>
11	Cobalt	2) Alkaline Digestion, Colorimetric Method <sup>[8,19]</sup> 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,17]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,17]</sup>
12	Copper	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,17]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[7,17]</sup>
13	2,4-D	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,26]</sup>
14	DDD	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,26]</sup>
15	DDE	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[10,26]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[11,26]</sup>
16	DDT	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup>

2) Soxhlet...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	Dieldrin	2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup> 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup>
18	Endrin	2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup> 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup>
19	Heptachlor	2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup> 1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup>
20	Lead	2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup> 1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,17]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
21	Lindane	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>

สม

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
22	Mercury	1) Waste Extraction, Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[1,6,20]</sup> 2) Waste Extraction, Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method <sup>[1,6,30]</sup> 3) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[20]</sup> 4) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method <sup>[30]</sup> 5) Thermal Decomposition Amalgamation and Atomic Absorption Spectrometric Method <sup>[21]</sup>
23	Methoxychlor	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 2) Soxhlet Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[10,26]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[11,26]</sup>
24	Mirex	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 2) Soxhlet Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[10,26]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic / Mass Spectrometric Method <sup>[11,26]</sup>
25	Molybdenum	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,17]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
26	Nickel	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,17]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
27	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - Aroclor 1242 - Aroclor 1248 - Aroclor 1254 - Aroclor 1260	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 2) Soxhlet Extraction, Gas Chromatographic Method <sup>[10,26]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic Method <sup>[11,26]</sup>

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
28	<ul style="list-style-type: none"> <li>- 2-Chlorobiphenyl</li> <li>- 2,3-Dichlorobiphenyl</li> <li>- 2,2',5-Trichlorobiphenyl</li> <li>- 2,4',5-Trichlorobiphenyl</li> <li>- 2,2',3,5'-Tetrachlorobiphenyl</li> <li>- 2,2',5,5'-Tetrachlorobiphenyl</li> <li>- 2,3',4,4'-Tetrachlorobiphenyl</li> <li>- 2,2',3,4,5'-Pentachlorobiphenyl</li> <li>- 2,2',4,5,5'-Pentachlorobiphenyl</li> <li>- 2,3,3',4,6-Pentachlorobiphenyl</li> <li>- 2,2',3,4,4',5'-Hexachlorobiphenyl</li> <li>- 2,2',3,4,5,5'-Hexachlorobiphenyl</li> <li>- 2,2',3,5,5',6-Hexachlorobiphenyl</li> <li>- 2,2',4,4',5,5'-Hexachlorobiphenyl</li> <li>- 2,2',3,3',4,4',5-Heptachlorobiphenyl</li> <li>- 2,2',3,4,4',5,5'-Heptachlorobiphenyl</li> <li>- 2,2',3,4,4',5,6-Heptachlorobiphenyl</li> <li>- 2,2',3,4',5,5',6-Heptachlorobiphenyl</li> <li>- 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl</li> </ul>	<p>1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method<sup>[1,9,26]</sup></p> <p>2) Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method<sup>[10,26]</sup></p> <p>3) Automated Soxhlet Extraction, Gas Chromatographic/Mass Spectrometric Method<sup>[11,26]</sup></p>
29	pH	Electrometric Method <sup>[23,24]</sup>
30	Selenium	<p>1) Waste Extraction, Digestion, Inductively Coupled Plasma Method<sup>[1,6,16]</sup></p> <p>2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method<sup>[1,6,17]</sup></p> <p>3) Digestion, Inductively Coupled Plasma Method<sup>[7,16]</sup></p> <p>4) Digestion, Inductively Coupled Plasma/Mass Spectrometric Method<sup>[7,17]</sup></p>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
31	Silver	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,17]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
32	Thallium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,17]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
33	Toxaphene	1) Waste Extraction, Separatory Funnel Liquid-Liquid Extraction, Gas Chromatographic/Mass Spectrometric Method <sup>[1,9,26]</sup> 2) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 3) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
34	Vanadium	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,17]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
35	Zinc	1) Waste Extraction, Digestion, Inductively Coupled Plasma Method <sup>[1,6,16]</sup> 2) Waste Extraction, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1,6,17]</sup> 3) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 4) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>

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ดิน จำนวน 125 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Acenaphthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup>
2	Acetone	2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
3	Aldrin	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
4	Anthracene	2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method <sup>[13]</sup>
5	Antimony	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup>
6	Arsenic	2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
7	Atrazine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup>
8	Barium	2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
9	Benz(a)anthracene	1) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup>
10	Benzene	2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
		1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup>
		2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
		1) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup>
		2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
		1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup>
		2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
		Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
11	Benzo(b)fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup>
12	Benzo(k)fluoranthene	2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
13	Benzoic acid	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup>
14	Benzo(a)pyrene	2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
15	Benzo(g,h,i)perylene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup>
16	Beryllium	2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
17	Bis(2-chloroethyl)ether	1) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup>
18	Bis(2-ethylhexyl)phthalate	2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
19	Bromodichloromethane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup>
20	Bromoform	2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
21	Butanol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup>
22	Butyl Benzyl Phthalate	2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
23	Cadmium	1) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
24	Carbazole	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
25	Carbon Disulfide	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
26	Carbon tetrachloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
27	Chlordane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
28	p-Chloroaniline	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
29	Chlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
30	Chlorodibromomethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
31	Chloroform	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
32	2-Chlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
33	Chromium	1) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
34	Chromium (III)	1) Digestion, Inductively Coupled Plasma Method; Alkaline Digestion, Colorimetric Method; Calculation Method <sup>[7,8,16,19]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method; Alkaline Digestion, Colorimetric Method; Calculation Method <sup>[7,8,17,19]</sup>
35	Chromium (VI)	Alkaline Digestion, Colorimetric Method <sup>[8,19]</sup>

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
36	Chrysene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
37	Cyanide	Extraction, Distillation, Colorimetric Method <sup>[27,28,29]</sup>
38	2,4-D	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
39	DDD	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
40	DDE	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
41	DDT	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
42	Dibenz(a,h)anthracene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
43	Di-n-Butyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
44	1,2-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
45	1,3-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
46	1,4-Dichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
47	3,3-Dichlorobenzidine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
48	1,1-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
49	1,2-Dichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
50	1,1-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
51	cis-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
52	trans-1,2-Dichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
53	2,4-Dichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
54	1,2-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
55	1,3-Dichloropropane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
56	1,3-Dichloropropene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
57	Dieldrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
58	Diethyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
59	2,4-Dimethylphenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
60	2,4-Dinitrophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
61	2,4-Dinitrotoluene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
62	2,6-Dinitrotoluene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>

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ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
63	Di-n-Octyl Phthalate	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
64	Endosulfan	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
65	Endrin	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
66	Ethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
67	Fluoranthene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
68	Fluorene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
69	Heptachlor	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
70	Heptachlor epoxide	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
71	Hexachlorobenzene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
72	Hexachloro-1,3-butadiene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
73	n-Hexane	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup> 2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method <sup>[13]</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
74	$\alpha$ -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
75	$\beta$ -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
76	$\gamma$ -HCH	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
77	Hexachlorocyclopentadiene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
78	Hexachloroethane	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
79	Indeno(1,2,3-cd)pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
80	Isophorone	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
81	Lead	1) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
82	Manganese	1) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
83	Mercury	1) Digestion, Cold-Vapor Atomic Absorption Spectrometric Method <sup>[20]</sup> 2) Thermal Decomposition, Amalgamation, and Atomic Absorption Spectrophotometry <sup>[21]</sup> 3) Digestion, Cold-Vapor Atomic Fluorescence Spectrometric Method <sup>[30]</sup>

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
84	Methanol	1) Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
85	Methoxychlor	2) Equilibrium Headspace, Gas Chromatographic/ Mass Spectrometric Method <sup>[13,25]</sup>
86	Methyl Bromide	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup>
87	Methylene Chloride	2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
88	2-methylphenol	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
89	2-Methylnaphthalene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup>
90	Methyl tert-Butyl Ether	2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
91	Naphthalene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup>
92	Nickel	2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
93	Nitrobenzene	1) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup>
94	N-Nitrosodiphenylamine	2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
95	N-Nitrosodi-n-propylamine	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup>
		2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>

31/10/25



ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
96	Polychlorinated biphenyls (PCBs) - Aroclor 1016 - Aroclor 1221 - Aroclor 1232 - 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	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
97	Pentachlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
98	Phenanthrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>

3/11/21

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
99	Phenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
100	Pyrene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
101	Selenium	1) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
102	Silver	1) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
103	Styrene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
104	1,1,2,2-Tetrachloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
105	Tetrachloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
106	Toluene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
107	Toxaphene	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
108	TPH (C <sub>5</sub> -C <sub>8</sub> )	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
109	TPH (C <sub>&gt;8</sub> - C <sub>16</sub> )	1) Automate Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Solvent Extraction, Gas Chromatographic Method <sup>[12,22]</sup> 3) Ultrasonic Extraction, Gas Chromatographic Method <sup>[22,31]</sup>
110	TPH (C <sub>&gt;16</sub> - C <sub>35</sub> )	1) Automate Extraction, Gas Chromatographic Method <sup>[11,22]</sup> 2) Solvent Extraction, Gas Chromatographic Method <sup>[12,22]</sup> 3) Ultrasonic Extraction, Gas Chromatographic Method <sup>[22,31]</sup>
111	1,2,4-Trichlorobenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
112	1,1,1-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
113	1,1,2-Trichloroethane	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
114	Trichloroethylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>

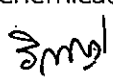
สมย

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
115	2,4,5-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
116	2,4,6-Trichlorophenol	1) Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[10,26]</sup> 2) Automated Soxhlet Extraction, Gas Chromatographic/ Mass Spectrometric Method <sup>[11,26]</sup>
117	1,3,5-Trimethylbenzene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
118	Vanadium	1) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>
119	Vinyl Acetate	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
120	Vinyl Chloride	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
121	m-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
122	o-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
123	p-Xylene	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
124	Xylene (Total)	Purge and Trap, Gas Chromatographic/ Mass Spectrometric Method <sup>[15,25]</sup>
125	Zinc	1) Digestion, Inductively Coupled Plasma Method <sup>[7,16]</sup> 2) Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[7,17]</sup>

ร.ก.ช.

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ที่ อก ๐๓๑๐(๑)/ ๔๑๒๑



กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๕ เมษายน ๒๕๖๗

เรื่อง เปลี่ยนแปลงบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๒๙ มีนาคม ๒๕๖๗

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร ขอเปลี่ยนแปลงบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว มีความเห็นดังนี้

๑. ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์ จำนวน ๓ ราย

- |                          |                            |
|--------------------------|----------------------------|
| ๑) นางสาวพรณิศา พุ่มคง   | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๕ |
| ๒) นายกำชัย สุทธะ        | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๒๑ |
| ๓) นางสาวศุภรดา ปันมยุรา | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๘ |

๒. ให้เพิ่มเจ้าหน้าที่ห้องปฏิบัติการวิเคราะห์เอกชน จำนวน ๑๒ ราย

- |                             |                            |
|-----------------------------|----------------------------|
| ๑) นางสาวฐานิดา กลิ่นเขียว  | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๒ |
| ๒) นางสาวกัญญภัตสร สายคำ    | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๓ |
| ๓) นางสาวณัฐนันท์ กันทะวงศ์ | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๔ |
| ๔) นายอำนาจ วงษาเคน         | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๕ |
| ๕) นายกฤษณพล ปัญญาวงศ์      | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๖ |
| ๖) นายณชากร ھرรรษา          | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๗ |
| ๗) นายวัชรินทร์ ผ่องสามสวน  | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๘ |
| ๘) นายณัฐพงศ์ โสภา          | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๙ |
| ๙) นายศักรินทร์ ปานเพ็ง     | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๙๐ |
| ๑๐) นายณัฐพล ชุ่มชื่น       | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๙๑ |
| ๑๑) นายธนา สุพาพันธุ์       | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๙๒ |
| ๑๒) นายนราธร แก้วพงษ์ษา     | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๙๓ |

อนึ่ง หนังสือฉบับนี้จะหมดอายุพร้อมหนังสือต่ออายุรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
ในวันที่ ๒ กันยายน ๒๕๖๙

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ



(นายพรยศ กลั่นกรอง)

รองอธิบดี ปฏิบัติราชการแทน

อธิบดีกรมโรงงานอุตสาหกรรม

กองวิจัยและเตือนภัยมลพิษโรงงาน

กลุ่มมาตรฐานวิธีการวิเคราะห์ทดสอบมลพิษและทะเบียนห้องปฏิบัติการ

โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๙๙

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ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

## ๑๘ ธันวาคม ๒๕๖๗

เรื่อง ยกเลิกบุคลากรของห้องปฏิบัติการวิเคราะห์

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๒ ธันวาคม ๒๕๖๗

ตามคำขอที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๐๔ สถานที่ตั้งเลขที่ ๑๐๔ ซอยพัฒนาการ ๔๐ ถนนพัฒนาการ แขวงพัฒนาการ เขตสวนหลวง กรุงเทพมหานคร ขอยกเลิกบุคลากร ความละเอียดแจ้งแล้ว นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้ยกเลิกเจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์  
จำนวน ๘ ราย ได้แก่

- |                               |                            |
|-------------------------------|----------------------------|
| ๑) นายประพจน์ วรรณชูชัย       | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๖๐ |
| ๒) นายจิรณัฐ ขาวละออ          | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๐๗๒ |
| ๓) นายพีรพัฒน์ กำคำ           | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๐๘ |
| ๔) นางสาวอรยา คำคล่อง         | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๓๔ |
| ๕) นายกิตติพงศ์ แซ่ลี         | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๔๔ |
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| ๗) นายภัทรพงษ์ มณฑาทอง        | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๖๗ |
| ๘) นางสาวจารุวรรณ กระจำพันธุ์ | ทะเบียนเลขที่ ว-๒๐๔-จ-๐๑๘๑ |

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

(นายธีรทัศน์ อิศรางกูร ณ อยุธยา)

รองอธิบดี ปฏิบัติราชการแทน

อธิบดีกรมโรงงานอุตสาหกรรม

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โทร. ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๐๓-๕

โทรสาร ๐ ๒๔๓๐ ๖๓๑๒ ต่อ ๒๑๙๙

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ที่ อก ๐๓๒๒/๖๓๖๕๙



กรมโรงงานอุตสาหกรรม  
ถนนพระรามที่ ๖ แขวงทุ่งพญาไท  
เขตราชเทวี กรุงเทพฯ ๑๐๔๐๐

๒๕ ก.ย. ๒๕๖๖

เรื่อง ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน

เรียน กรรมการผู้จัดการ บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด

อ้างถึง คำขอขึ้นทะเบียน/ต่ออายุ/เปลี่ยนแปลงบุคลากร และชนิดสารมลพิษของห้องปฏิบัติการวิเคราะห์เอกชน  
ลงวันที่ ๑๔ กรกฎาคม ๒๕๖๖

สิ่งที่ส่งมาด้วย เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด จำนวน ๓ แผ่น

ตามหนังสือที่อ้างถึง บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด ขอต่ออายุ  
หนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน เลขทะเบียน ว-๒๖๗ สถานที่ตั้ง เลขที่ ๑๑๔/๑ หมู่ที่ ๘  
ถนนกาญจนวนิช ตำบลบ้านพรุ อำเภอหาดใหญ่ จังหวัดสงขลา ต่อกรมโรงงานอุตสาหกรรม นั้น

กรมโรงงานอุตสาหกรรมพิจารณาแล้ว ให้บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย)  
จำกัด ต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน โดยมีองค์ประกอบดังนี้

ก. ผู้ควบคุมดูแลห้องปฏิบัติการวิเคราะห์

นางสาวกนิษฐา เหมประสาทร

ทะเบียนเลขที่ ว-๒๖๗-ค-๐๐๐๑

ข. เจ้าหน้าที่ประจำห้องปฏิบัติการวิเคราะห์

๑) นางสาวอินทิรา คงประยูร

ทะเบียนเลขที่ ว-๒๖๗-จ-๐๐๐๑

๒) นางสาวอมรรัตน์ เพชรประดับ

ทะเบียนเลขที่ ว-๒๖๗-จ-๐๐๐๒

๓) นายทักษิณ อินโตรม

ทะเบียนเลขที่ ว-๒๖๗-จ-๐๐๐๓

๔) นางสาวอณัฏฐา บุญเพชร

ทะเบียนเลขที่ ว-๒๖๗-จ-๐๐๐๔

๕) นางสาวสุทธริกา ทิพย์รัตน์

ทะเบียนเลขที่ ว-๒๖๗-จ-๐๐๐๕

๖) นางสาวนริสา นฤมิตร

ทะเบียนเลขที่ ว-๒๖๗-จ-๐๐๐๖

๗) นายวุฒิชัย ทวยเจริญ

ทะเบียนเลขที่ ว-๒๖๗-จ-๐๐๐๗

๘) นายยงศิลป์ รังษี

ทะเบียนเลขที่ ว-๒๖๗-จ-๐๐๐๘

๙) นายอภิวัฒน์ ฉันทะ

ทะเบียนเลขที่ ว-๒๖๗-จ-๐๐๐๙

๑๐) นายศิริชัย เกลี้ยงเกิด

ทะเบียนเลขที่ ว-๒๖๗-จ-๐๐๑๐

๑๑) นายสมศักดิ์ จันทรวง

ทะเบียนเลขที่ ว-๒๖๗-จ-๐๐๑๑

๑๒) นางสาวพิชญา ศุภรานนท์

ทะเบียนเลขที่ ว-๒๖๗-จ-๐๐๑๒

๑๓) นายปัญญา เกียรติพิมุรักษ์

ทะเบียนเลขที่ ว-๒๖๗-จ-๐๐๑๓

๑๔) นางสาวศศิณิภา รอดทองอ่อน

ทะเบียนเลขที่ ว-๒๖๗-จ-๐๐๑๔

๑๕) นางสาวชุติมา สุขสวัสดิ์

ทะเบียนเลขที่ ว-๒๖๗-จ-๐๐๑๕

๑๖) นางสาวจันทิมา คงทน

ทะเบียนเลขที่ ว-๒๖๗-จ-๐๐๑๖

๑๗) นางสาวกุลวดี เรืองประพันธ์

ทะเบียนเลขที่ ว-๒๖๗-จ-๐๐๑๗

๑๘) นางสาวอาทิตย์ยา เมืองแก้ว

ทะเบียนเลขที่ ว-๒๖๗-จ-๐๐๑๘

๑๙) นางสาวกวิณณา ฉุนย่อง

ทะเบียนเลขที่ ว-๒๖๗-จ-๐๐๑๙

ค. ขอบข่ายสารมลพิษที่ได้รับขึ้นทะเบียนให้วิเคราะห์ในน้ำเสียและอากาศเสีย ตามสิ่งที่ส่งมาด้วย  
หนังสือฉบับนี้...



หนังสือฉบับนี้จะหมดอายุในวันที่ ๑๖ สิงหาคม ๒๕๖๙ หากประสงค์จะต่ออายุหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ให้ยื่นคำขอต่ออายุพร้อมเอกสารประกอบคำขอต่อมรมโรงงานอุตสาหกรรมภายใน ๓๐ วัน ก่อนวันสิ้นอายุของหนังสือรับขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน ทั้งนี้ สามารถยื่นคำขอผ่านระบบอิเล็กทรอนิกส์ได้ที่หน้าเว็บไซต์กรมโรงงานอุตสาหกรรม

จึงเรียนมาเพื่อทราบ

ขอแสดงความนับถือ

๓

(นายเนเรศวร์ ตริยงค์)

ผู้อำนวยการศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคใต้  
ปฏิบัติราชการแทนอธิบดีกรมโรงงานอุตสาหกรรม

ศูนย์วิจัยและเตือนภัยมลพิษโรงงานภาคใต้

โทร. ๐ ๗๔๓๒ ๕๐๒๙, ๐ ๗๔๘๙ ๐๖๓๔ ต่อ ๕๒๐๑

ไปรษณีย์อิเล็กทรอนิกส์ sirw@diw.mail.go.th



เอกสารแนบท้ายหนังสือรับต่ออายุขึ้นทะเบียนห้องปฏิบัติการวิเคราะห์เอกชน  
บริษัท เอแอลเอส แลบบอราทอรี กรุ๊ป (ประเทศไทย) จำกัด เลขทะเบียน ว-๒๖๗  
ที่ อก ๐๓๒๒/๑๓๖๕๙ ลงวันที่ ๒๕ ก.ย. ๒๕๖๖

ขอขยายสารมลพิษที่ได้รับการขึ้นทะเบียนจากกรมโรงงานอุตสาหกรรม จำนวน ๓๗ รายการ  
น้ำเสีย จำนวน 25 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Arsenic	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1]</sup>
2	Barium	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1]</sup>
3	Biochemical Oxygen Demand	5-Day BOD Test, Azide Modification Method <sup>[1]</sup> 5-Day BOD Test, Membrane Electrode Method <sup>[1]</sup>
4	Cadmium	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1]</sup>
5	Chemical Oxygen Demand	Closed Reflux, Colorimetric Method <sup>[1]</sup> Closed Reflux, Titrimetric Method <sup>[1]</sup>
6	Chromium	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1]</sup>
7	Color	ADMI Weighted-Ordinate Spectrophotometric Method <sup>[1]</sup>
8	Copper	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1]</sup>
9	Formaldehyde	Distillation, Colorimetric Method <sup>[2]</sup>
10	Free Chlorine	DPD Ferrous Titrimetric Method <sup>[1]</sup>
11	Hexavalent Chromium	Filtration, Colorimetric Method <sup>[1]</sup>
12	Lead	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1]</sup>
13	Manganese	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1]</sup>
14	Mercury	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1]</sup>
15	Nickel	Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[1]</sup>
16	Oil & Grease	Liquid-Liquid, Partition-Gravimetric Method <sup>[1]</sup>

บุษยา รัตนสุภา  
(นางสาวบุษยา รัตนสุภา)  
นักวิทยาศาสตร์ชำนาญการ

17 pH...

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
17	pH	Electrometric Method <sup>[1]</sup>
18	Phenol	Distillation, Direct Photometric Method <sup>[1]</sup>
19	Selenium	Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[1]</sup>
20	Sulfide	ZnS Precipitation, Iodometric Method <sup>[1]</sup>
21	Temperature	Laboratory and Field Methods <sup>[1]</sup>
22	Total Dissolved Solids	Dried at 180 °C <sup>[1]</sup>
23	Total Suspended Solids	Dried at 103-105 °C <sup>[1]</sup>
24	Trivalent Chromium	Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[1]</sup>
25	Zinc	Digestion, Inductively Coupled Plasma/ Mass Spectrometric Method <sup>[1]</sup>

อากาศเสีย จำนวน 12 รายการ

ลำดับที่	สารมลพิษ	วิธีวิเคราะห์
1	Antimony	Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[3]</sup>
2	Arsenic	Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[3]</sup>
3	Carbon Monoxide	Sampling Bag Non-Dispersive Infrared Method <sup>[3]</sup>
4	Copper	Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[3]</sup>
5	Dioxins	Isokinetic Sampling, Analysis by ISO/IEC 17025 Accredited Laboratory or Analysis by Department of Industrial Works Registered Laboratory <sup>[3]</sup>
6	Hydrogen Sulfide	Absorption, Iodometric Method <sup>[3]</sup>
7	Lead	Isokinetic Sampling, Digestion, Inductively Coupled Plasma/Mass Spectrometric Method <sup>[3]</sup>
8	Opacity	Ringelmann's Method <sup>[4]</sup>
9	Oxides of Nitrogen	Absorption Sampling, Phenoldisulfonic acid Method <sup>[3]</sup>
10	Sulfur Dioxide	Absorption Sampling, Barium-Thorin Titrimetric Method <sup>[3]</sup>
11	Sulfuric acid	Isokinetic Sampling, Barium-Thorin Titrimetric Method <sup>[3]</sup>
12	Total Suspended Particulate	Isokinetic Sampling, Gravimetric Method <sup>[3]</sup>

บุษผา รัตนสุภา  
(นางสาวบุษผา รัตนสุภา)  
นักวิทยาศาสตร์ชำนาญการ

เอกสารอ้างอิง....

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