

ภาคผนวก ง

ผลการวิเคราะห์ทางห้องปฏิบัติการ

ภาคผนวก ง1

ผลการวิเคราะห์คุณภาพน้ำทิ้ง

ANALYSIS REPORT

CUSTOMER NAME : CARLTON HOTEL BANGKOK SUKHUMVIT
ADDRESS : 491 SUKUMVIT ROAD KHLONG TOEI NUEA WATTHANA BANGKOK 10110
CONTACT INFORMATION :
SAMPLING SOURCE : WASTEWATER TREATMENT PLANT
SAMPLE TYPE : WASTEWATER
SAMPLING DATE : SEPTEMBER 18, 2025
SAMPLING TIME : 1/
SAMPLING METHOD : GRAB, GRAB AND STERILE TECHNIQUE
SAMPLING BY :
ANALYZED BY :
RECEIVED DATE : SEPTEMBER 18, 2025
ANALYTICAL DATE : SEPTEMBER 18-26, 2025
ISSUE DATE : SEPTEMBER 26, 2025
REPORT NO. : 2025-U087865
WORK NO. : 2024-009366
ANALYSIS NO. : T25AU957-0001 - T25AU957-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT		REGULATORY STANDARD	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			1 15:35 HOUR 1/ T25AU957-0001	2 15:30 HOUR 1/ T25AU957-0002			
pH ^a	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500-H ⁺ B AND 1060 B	6.4 (31.6°C)	6.1 (33.0°C)	5.5-9.0	-	-
BIOCHEMICAL OXYGEN DEMAND ^a	mg/L	MEMBRANE ELECTRODE METHOD (SM: PART 5210 B AND PART 4500-O G)	208	110	≤ 20	-	2.0
TOTAL SUSPENDED SOLIDS ^a	mg/L	TOTAL SUSPENDED SOLIDS DRIED FROM 103 TO 105 °C (SM: PART 2540 D)	90.4	40.2	≤ 30	-	5.0
TOTAL DISSOLVED SOLIDS ^b	mg/L	TOTAL DISSOLVED SOLIDS DRIED AT 180 °C (SM: PART 2540 C)	271	361	≤ 1,000	-	25
SULPHIDE ^b	mg/L	IODOMETRIC METHOD (SM: PART 4500-S ²⁻ F)	2.4	< 0.50	≤ 1.0	-	0.50
TOTAL KJELDAHL NITROGEN ^b	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: PART 4500-Norg C	44.3	< 5.0	≤ 35	1.5	5.0
OIL AND GREASE ^a	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: PART 5520 B)	20	< 3	≤ 20	-	3



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT		REGULATORY STANDARD	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			1 15:35 HOUR 1/ T25AU957-0001	2 15:30 HOUR 1/ T25AU957-0002			
MICROBIOLOGY							
TOTAL COLIFORMS ^b	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B AND C)	>160,000	7,900	-	1.8	-
SAMPLE CONDITION							
WATER'S COLOUR/TURBID SEDIMENT			YELLOW/TURBID BROWN	YELLOW/TURBID BROWN			

^a : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

^b : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24th EDITION, 2023.

RESULT 1 : ขอบรับสภาพน้ำ

RESULT 2 : ขอน้ำใส

REGULATORY STANDARD : RANGE OR MAXIMUM PERMITTED VALUE FOR BUILDING EFFLUENT STANDARDS CLASS A, NOTIFICATION OF THE MINISTRY OF RESOURCES AND ENVIRONMENT, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 141, PART 233 D, DATED AUGUST 27, 2024.

LABORATORY SUPERVISOR

ANALYSIS REPORT

CUSTOMER NAME : CARLTON HOTEL BANGKOK CO., LTD.
ADDRESS : 491 SUKUMVIT ROAD KHLONG TOEI NUEA WATTHANA BANGKOK 10110
CONTACT INFORMATION :
SAMPLING SOURCE : WASTEWATER TREATMENT PLANT
SAMPLE TYPE : WASTEWATER
SAMPLING DATE : DECEMBER 18, 2025
SAMPLING TIME : 1/
SAMPLING METHOD : GRAB, GRAB AND STERILE TECHNIQUE
SAMPLING BY :
ANALYZED BY :
RECEIVED DATE : DECEMBER 18, 2025
ANALYTICAL DATE : DECEMBER 18-25, 2025
ISSUE DATE : DECEMBER 26, 2025
REPORT NO. : 2025-U117877
WORK NO. : 2025-006897
ANALYSIS NO. : T25BC634-0001 - T25BC634-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT		REGULATORY STANDARD	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			1 14:45 HOUR 1/ T25BC634-0001	2 14:40 HOUR 1/ T25BC634-0002			
pH ^a	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500-H ⁺ B AND 1060 B	6.8 (30.2°C)	7.2 (29.8°C)	5.5-9.0	-	-
BIOCHEMICAL OXYGEN DEMAND ^a	mg/L	MEMBRANE ELECTRODE METHOD (SM: PART 5210 B AND PART 4500-O G)	305	12.7	≤ 20	-	2.0
TOTAL SUSPENDED SOLIDS ^a	mg/L	TOTAL SUSPENDED SOLIDS DRIED FROM 103 TO 105 °C (SM: PART 2540 D)	113	8.2	≤ 30	-	5.0
TOTAL DISSOLVED SOLIDS ^b	mg/L	TOTAL DISSOLVED SOLIDS DRIED AT 180 °C (SM: PART 2540 C)	308	406	≤ 1,000	-	25
SULPHIDE ^b	mg/L	IODOMETRIC METHOD (SM: PART 4500-S ₂ - F)	0.64	< 0.50	≤ 1.0	-	0.50
TOTAL KJELDAHL NITROGEN ^b	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: PART 4500-Norg C	40.0	7.3	≤ 35	1.5	5.0
OIL AND GREASE ^a	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: PART 5520 B)	10	< 3	≤ 20	-	3



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT		REGULATORY STANDARD	DETECTION LIMIT	LIMIT OF QUANTITATION (LOQ)
			1 14:45 HOUR 1/ T25BC634-0001	2 14:40 HOUR 1/ T25BC634-0002			
MICROBIOLOGY							
TOTAL COLIFORMS ^b	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B AND C)	>160,000	7,900	-	1.8	-
SAMPLE CONDITION							
WATER'S COLOUR/TURBID			YELLOW/TURBID	YELLOW/CLEAR			
SEDIMENT			BROWN	BROWN			

^a : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

^b : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24th EDITION, 2023.

RESULT 1 : บอปรับสภาพน้ำ

RESULT 2 : บอน้ำใส

REGULATORY STANDARD : RANGE OR MAXIMUM PERMITTED VALUE FOR BUILDING EFFLUENT STANDARDS CLASS A, NOTIFICATION OF THE MINISTRY OF RESOURCES AND ENVIRONMENT, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 141, PART 233 D, DATED AUGUST 27, 2024.

LABORATORY SUPERVISOR

ภาคผนวก ง2

ผลการวิเคราะห์คุณภาพน้ำหอฝิ่งเย็น

ANALYSIS REPORT

CUSTOMER NAME : CARLTON HOTEL BANGKOK CO., LTD.
ADDRESS : 491 SUKUMVIT ROAD KHLONG TOEI NUEA WATTHANA BANGKOK 10110
CONTACT INFORMATION :
SAMPLING SOURCE : COOLING TOWER
SAMPLE TYPE : COOLING WATER
SAMPLING DATE : DECEMBER 18, 2025
SAMPLING TIME : 14:05 HOUR
SAMPLING METHOD ° : GRAB, GRAB AND STERILE TECHNIQUE
SAMPLING BY ° :
ANALYZED BY :
RECEIVED DATE : DECEMBER 18, 2025
ANALYTICAL DATE : DECEMBER 18-24, 2025
ISSUE DATE : JANUARY 9, 2026
REPORT NO. : 2026-U001468
WORK NO. : 2024-009366
ANALYSIS NO. : T25BC633-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	DETECTION LIMIT
			น้ำเข้ามาเดิม ในอ่างรองรับ T25BC633-0001	
pH ^c	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500 -H ⁺ B AND 1060 B	7.4 (27.2°C)	-
RESIDUAL CHLORINE ^c	mg/L Cl ₂	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	0.1
MICROBIOLOGY				
TOTAL COLIFORMS ^b	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B AND C)	5.6	1.8
SAMPLE CONDITION WATER'S COLOUR/TURBID SEDIMENT			COLOURLESS/CLEAR	

^b : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

^c : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT NOT IN SCOPE OF ACCREDITATION

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24th EDITION, 2023.

ND : NOT DETECTED.

LABORATORY SUPERVISOR

ANALYSIS REPORT

CUSTOMER NAME : CARLTON HOTEL BANGKOK CO., LTD.
ADDRESS : 491 SUKUMVIT ROAD KHLONG TOEI NUEA WATTHANA BANGKOK 10110
CONTACT INFORMATION :
SAMPLING SOURCE : COOLING TOWER
SAMPLE TYPE : COOLING WATER
SAMPLING DATE : DECEMBER 18, 2025
SAMPLING TIME : 14:05 HOUR
SAMPLING METHOD * : GRAB AND STERILE TECHNIQUE
SAMPLING BY * :
ANALYZED BY :
RECEIVED DATE : DECEMBER 18, 2025
ANALYTICAL DATE : DECEMBER 18, 2025 - JANUARY 5, 2026
ISSUE DATE : JANUARY 9, 2026
REPORT NO. : 2026-U001469
WORK NO. : 2024-009366
ANALYSIS NO. : T25BC633-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			น้ำเข้ามาเต็ม ในอ่างรองรับ T25BC633-0001		
MICROBIOLOGY					
Legionella spp.	CFU/L	ISO 11731:2017-05 (E)	NOT DETECTED	NOT DETECTED	100
SAMPLE CONDITION					
WATER'S COLOUR/TURBID			COLOURLESS/CLEAR		
SEDIMENT			-		

THE LABORATORY HAS BEEN ACCEPTED AS AN ACCREDITED LABORATORY COMPLYING WITH THE ISO/IEC 17025.

* : TEST METHOD ARE NOT COVERED COMPLYING WITH THE ISO/IEC 17025, VERIFIED BY OWN LABORATORY QUALITY SYSTEM.

REGULATORY STANDARD : ANNOUNCEMENT OF THE DEPARTMENT OF HEALTH (THAILAND), PRACTICE FOR THE CONTROL OF LEGIONELLA BACTERIA IN COOLING TOWERS, JANUARY 2001.

LABORATORY SUPERVISOR



ANALYSIS REPORT

CUSTOMER NAME : CARLTON HOTEL BANGKOK CO., LTD.
ADDRESS : 491 SUKUMVIT ROAD KHLONG TOEI NUEA WATTHANA BANGKOK 10110
CONTACT INFORMATION :
SAMPLING SOURCE : COOLING TOWER
SAMPLE TYPE : COOLING WATER
SAMPLING DATE : DECEMBER 18, 2025
SAMPLING TIME : 14:00 HOUR
SAMPLING METHOD ° : GRAB, GRAB AND STERILE TECHNIQUE
SAMPLING BY ° :
ANALYZED BY :
RECEIVED DATE : DECEMBER 18, 2025
ANALYTICAL DATE : DECEMBER 18-24, 2025
ISSUE DATE : JANUARY 9, 2026
REPORT NO. : 2026-U001470
WORK NO. : 2024-009366
ANALYSIS NO. : T25BC633-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	DETECTION LIMIT
			หน้าห้องจาก ห้องส่งเป็น T25BC633-0002	
pH ^c	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500 -H ⁺ B AND 1060 B	8.7 (27.0°C)	-
RESIDUAL CHLORINE ^c	mg/L Cl ₂	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	0.1
MICROBIOLOGY				
TOTAL COLIFORMS ^b	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B AND C)	< 1.8	1.8
SAMPLE CONDITION WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR -	

^b : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

^c : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT NOT IN SCOPE OF ACCREDITATION

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 24th EDITION, 2023.

ND : NOT DETECTED.

LABORATORY SUPERVISOR

ANALYSIS REPORT

CUSTOMER NAME : CARLTON HOTEL BANGKOK CO., LTD.
ADDRESS : 491 SUKUMVIT ROAD KHLONG TOEI NUEA WATTHANA BANGKOK 10110
CONTACT INFORMATION :
SAMPLING SOURCE : COOLING TOWER
SAMPLE TYPE : COOLING WATER
SAMPLING DATE : DECEMBER 18, 2025
SAMPLING TIME : 14:00 HOUR
SAMPLING METHOD * : GRAB AND STERILE TECHNIQUE
SAMPLING BY * :
ANALYZED BY :
RECEIVED DATE : DECEMBER 18, 2025
ANALYTICAL DATE : DECEMBER 18, 2025 - JANUARY 5, 2026
ISSUE DATE : JANUARY 9, 2026
REPORT NO. : 2026-U001471
WORK NO. : 2024-009366
ANALYSIS NO. : T25BC633-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			ห่อน้ำทิ้งจากหอฝักเป็น T25BC633-0002		
MICROBIOLOGY					
Legionella spp.	CFU/L	ISO 11731:2017-05 (E)	NOT DETECTED	NOT DETECTED	100
SAMPLE CONDITION					
WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR		

THE LABORATORY HAS BEEN ACCEPTED AS AN ACCREDITED LABORATORY COMPLYING WITH THE ISO/IEC 17025.

* : TEST METHOD ARE NOT COVERED COMPLYING WITH THE ISO/IEC 17025, VERIFIED BY OWN LABORATORY QUALITY SYSTEM.

REGULATORY STANDARD : ANNOUNCEMENT OF THE DEPARTMENT OF HEALTH (THAILAND), PRACTICE FOR THE CONTROL OF LEGIONELLA BACTERIA IN COOLING TOWERS, JANUARY 2001.



LABORATORY SUPERVISOR

