Term Contract for Provision of Sampling and Analyzing of Samples for Various Sewage Treatment Facilities in Urban Area, Lantau and Outlying Islands to the Drainage Service Department

Provision of Effluent Quality Monitoring (EQM) Services

Report for the Month of Oct 2020

Contract No.	:	DE/2020/02
Applicant	:	SEWAGE TREATMENT DIVISION 2 ELECTRICAL AND MECHANICAL BRANCH DRAINAGE SERVICES DEPARTMENT
Address	:	STONECUTTERS ISLAND SEWAGE TREATMENT WORKS., NGONG SHUNG ROAD, NGONG SHUEN CHAU, KOWLOON, HONG KONG
Application Number	:	LZ023851(8)
Report Number	:	AZ0051791(1)
Report Issued Date	:	17 Nov 2020

For and on behalf of
CMA Industrial Development Foundation Limited

Authorized Signature : _____

Lau Yan Kin
Senior Manager
Environmental Division

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatesting.org Web Site: http://www.cmatesting.org

TABLE OF CONTENT

EXECUTIVE SUMMARY

1. This is the water quality monitoring report prepared by CMA Testing and Certification Laboratory (CMA Testing) for Contract No. DE/2020/02 "Term Contract for Provision of Sampling and analysing of Sludge Samples for Various Sewage Treatment Facilities in Urban Area, Lantau and Outlying Islands to the Drainage Services Department''. This report documented the results and findings of Operation Phase Environmental Monitoring works conducted for Effluent Quality Monitoring (EQM) of Project in Oct 2020.

2. In accordance with the Final EM&A Manual, environmental monitoring has been conducted in the reporting month with a Quarterly Basis for various parameters as summarized in **Table I**.

Table I Summary Table for Environmental Monitoring Works Conducted in the Reporting Month

Monitoring Parameters	Monitoring Date	Laboratory Testing Parameters
Effluent Quality	21 Oct 2020 to 22 Oct 2020	Total Residual Chlorine (TRC) Chlorination by-products (CBPs) and Contaminants of Concern (COCs)

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
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1. INTRODUCTION

1.1. CMA Testing was commissioned by Drainage Services Department (DSD) to undertake the operation phase environmental monitoring for Advance Disinfection Facilities (ADF) at Stonecutters Island Sewage Treatment Works (SCISTW) (thereafter called the "the Services").

1.2. The operation phase monitoring, which include effluent quality monitoring, marine water quality monitoring and emergency discharge monitoring, is to monitor the effluent and marine water quality impact of ADF during its operation phase.

1.3. This is the water quality monitoring report prepared by CMA Testing that documented the results and findings of Operation Phase Water Quality Monitoring works conducted for Effluent Quality Monitoring (EQM) of Project on 21 Oct 2020 to 22 Oct 2020.

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatesting.org Web Site: http://www.cmatesting.org

2. EFFLUENT QUALITY MONITORING

Monitoring Requirements

2.1. Effluent samples were collected at Disinfection Facilities in a full 24-hour period. 24-hour flow weighted composite effluent samples for subsequent chemical analysis and testing were prepared by CMA according to the following procedures:

- Collect effluent sub-sample by direct grab sampling method at bi-hourly interval over a 24 hour period;
- Obtain flow record of Stonecutters Island Sewage Treatment Works (SCISTW) for the 24-hour sampling period;
- Calculate the volume of each sub-sample for preparation the bi-hourly of 24 hour flow-weighted composite samples; and
- Transfer the appropriate the volume of sub-samples to a clean container and mix thoroughly.

2.2. Bi-hourly of 24-hour composite sample for Total Residual Chloride (TRC), Chlorination By-Products (CBPs) and Contaminants of Concern (COCs) tests shall be performed quarterly throughout the contract period.

Monitoring Location

2.3. The sampling locations for effluent from SCISTW were collected at the Disinfection Facilities

Monitoring Schedule

2.4. The effluent quality monitoring was conducted between the time periods of 10:00am 21 Oct 2020 to 10:00am of 22 Oct 2020 in the reporting month. Collection of marine water samples were within the time period of effluent quality monitoring was to be collected.

Laboratory Measurement / Analysis

2.5. In the reporting month, the bi-hourly of 24-hour flow-weighted composite effluent sample was collected for subsequent laboratory analysis and testing on TRC, CBPs and COCs as shown in **Table 2.1.**

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Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
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Table 2.1 Analytical Methods for Laboratory Analysis for Effluent Samples

Parameters		Analytical Method	Limit of Reporting (µg/L)
TRC and Potential CBPs			
Total Residual Chlorine		APHA 23ed 4500 Cl G	10
Bromoform	Tri-halomethanes (THMs)	USEPA 8260B	0.1
Bromodichloromethane			0.1
Chloroform			0.1
Dibromochloromethane			5
Bromoacetic acid	Haloacetic Acids (HAAs)	In house method TG-ENV-WW-79 (by GC-ECD)	2
Chloroacetic acid			2
Dibromoacetic acid			2
Dichloroacetic acid			2
Trichloroacetic acid			2
Contaminants of Concern (COCs)			
Methylene chloride	Halogenated Aliphatics	ISO 17943:2016 & USEPA 8206B	20
Carbon tetrachloride			0.5
1,1-dichloroethane			0.5
1,2-dichloroethane			0.5
1,1-dichloroethylene			0.5
1,2-dichloropropane			0.5
Tetrachloroethylene			0.5
1,1,1-trichloroethane			0.5
1,1,2-trichloroethane			0.5
Trichloroethylene			0.5
2-chlorophenol	Phenols & Haloethers	In house method TG-ENV-WW-80, 84 & 86 (by GC-MSD)	0.5
2,4-dichlorophenol			0.5
p-chloro-m-cresol			0.5
Pentachlorophenol			0.5
2,4,6-trichlorophenol			0.5
Bis(2-chloroethoxy) methane			0.5
Chlorobenzene	Chlorinated Hydrocarbons & Organochlorine Pesticides	In house method TG-ENV-WW-78 (by Headspace GC-MSD) & In house method TG-ENV-WW-86 (by GC-MSD)	0.5
1,4-dichlorobenzene			0.5
Hexachlorobenzene			0.01
Hexachlorocyclopentadiene			2.5
Hexachloroethane			0.5
1,2,4-trichlorobenzene			0.5
Alpha-BHC			0.01
Beta-BHC			0.01
Gamma-BHC			0.01

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3. RESULTS AND OBSERVATIONS

Effluent Quality

3.1. The results of effluent quality monitoring conducted on the time period of 10:00am 21 Oct 2020 to 10:00am of 22 Oct 2020, whereas the laboratory testing and QC report are shown in **Appendix I- Report no. AZ0051790(0).**

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatesting.org Web Site: http://www.cmatesting.org

Appendix I - Report for Laboratory Test(s)

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatesting.org Web Site: http://www.cmatesting.org

TEST REPORT

Report No.	:	AZ0051790(0)	Date: 17 Nov 2020
Application No.	:	LZ023851(8)	
Applicant	:	SEWAGE TREATMENT DIVISION 2 ELECTRICAL AND MECHANICAL BRANCH DRAINAGE SERVICES DEPARTMENT STONECUTTERS ISLAND SEWAGE TREATMENT WORKS., NGONG SHUNG ROAD, NGONG SHUEN CHAU, KOWLOON, HONG KONG	

Contract No.	:	DE/2020/02
Project Name	:	Term Contract for Provision of Sampling and Analyzing of Samples for Various Sewage Treatment Facilities in Urban Area, Lantau and Outlying Islands to the Drainage Services Department
Sample Description	:	One (1) wastewater sample sampled by the staff of CMA Industrial Development Foundation Limited. Sample was refrigerated during delivery.
Sample ID	:	Refer to Sample ID on page 4.
Sampling Location	:	SCISTW- Disinfection Facilities
Sampling Date	:	21 Oct 2020 to 22 Oct 2020.
Date Received	:	22 Oct 2020.
Test Period	:	22 Oct 2020 to 16 Nov 2020.

For and on behalf of
CMA Industrial Development Foundation Limited

Authorized Signature : _____

Lau Yan Kin
Senior Manager
Environmental Division

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
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TEST REPORT

Report No. : AZ0051790(0) Date: 17 Nov 2020

Application No. : LZ023851(8)

Test Requested :

1. Total Residual Chlorine
2. Bromoform
3. Bromodichloromethane
4. Chloroform
5. Dibromochloromethane
6. Bromoacetic acid
7. Chloroacetic acid
8. Dibromoacetic acid
9. Dichloroacetic acid
10. Trichloroacetic acid
11. Methylene chloride
12. Carbon tetrachloride
13. 1,1-dichloroethane
14. 1,2-dichloroethane
15. 1,1-dichloroethylene
16. 1,2-dichloropropane
17. Tetrachloroethlyene
18. 1,1,1-trichloroethane
19. 1,1,2-trichloroethane
20. Trichloroethylene
21. 2-chlorophenol
22. 2,4-dichlorophenol
23. p-chloro-m-cresol
24. Pentachlorophenol
25. 2,4,6-trichlorophenol
26. Bis(2-chloroethoxy) methane
27. Chlorobenzene
28. 1,4-dichlorobenzene
29. Hexachlorobenzene
30. Hexachlorocyclopentadiene
31. Hexachloroethane
32. 1,2,4-trichlorobenzene
33. Alpha-BHC
34. Beta-BHC
35. Gamma-BHC

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TEST REPORT

Report No. : AZ0051790(0) Date: 17 Nov 2020

Application No. : LZ023851(8)

Test Method : 1. APHA 23ed 4500 Cl G
2-5. USEPA 8260B
6-10. TG-ENV-WW-79 (by GC-ECD)
11-20. ISO 17943:2016 & USEPA 8260B
21-26. In house method TG-ENV-WW-80, 84 & 86 (by GC-MSD)
27-35. In house method TG-ENV-WW-78 (by Headspace GC-MSD)
& In house method TG-ENV-WW-86 (by GC-MSD)

Test Result : Refer to results on page 4.

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TEST REPORT

Report No. : AZ0051790(0) Date: 17 Nov 2020

Application No. : LZ023851(8)

Effluent Water Quality

Application No:.	LZ023851
Sampling Date	21-Oct-20 to 22-Oct-20
Monitoring Location	Chamber 15A

Parameter	Results (mg/L)
Total Residual Chlorine	<0.01

Parameter	Results (µg/L)
Bromoform	0.20
Bromodichloromethane	<0.1
Chloroform	4.3
Dibromochloromethane	<5
Bromoacetic acid	<2
Chloroacetic acid	<2
Dibromoacetic acid	2.6
Dichloroacetic acid	9.7
Trichloroacetic acid	5.1

Parameter	Results (µg/L)
Methylene chloride	<20
Carbon tetrachloride	<0.5
1,1-dichloroethane	<0.5
1,2-dichloroethane	<0.5
1,1- dichloroethylene	<0.5
1,2-dichloropropane	<0.5
Tetrachloroethylene	1.6
1,1,1-trichloroethane	<0.5
1,1,2-trichloroethane	<0.5
Trichloroethylene	0.7
2-chlorophenol	<0.5
2,4-dichlorophenol	<0.5
p-chloro-m-cresol	<0.5
Pentachlorophenol	<0.5
2,4,6-trichlorophenol	<0.5
Bis(2-chloroethoxy) methane	<0.5
Chlorobenzene	<0.5
1,4-dichlorobenzene	<0.5
Hexachlorobenzene	<0.01
Hexachlorocyclopentadiene	<2.5
Hexachloroethane	<0.5
1,2,4-trichlorobenzene	<0.5
Alpha-BHC	<0.01
Beta-BHC	<0.01
Gamma-BHC	<0.01

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatesting.org Web Site: http://www.cmatesting.org

Report No. : AZ0051790(0) Date: 17 Nov 2020

Application No. : LZ0023851(8)

QC Report

Sampling Date 21-Oct-20 to 22-Oct-20

Parameter	Method Blank	Acceptance Criteria	QC Recovery	Acceptance Criteria	Spike Recovery	Acceptance Criteria	Duplicate (RPD)	Acceptance Criteria
	(mg/L)	(mg/L)	(%)	(%)	(%)	(%)	(%)	(%)
Total Residual Chlorine	<0.01	<0.01	112	85-115	103	85-115	<1	≤20

Parameter	Method Blank	Acceptance Criteria	QC Recoery	Acceptance Criteria	Spike Recovery	Acceptance Criteria	Duplicate (RPD)	Acceptance Criteria
	(µg/L)	(µg/L)	(%)	(%)	(%)	(%)	(%)	(%)
Bromoform	<0.02	<0.02	104	80-120	97	70-130	4	≤20
Bromodichloromethane	<0.02	<0.02	96	80-120	92	70-130	8	≤20
Chloroform	<0.02	<0.02	92	80-120	108	70-130	9	≤20
Dibromochloromethane	<1	<1	88	80-120	114	70-130	6	≤20
Bromoacetic acid	<0.4	<0.4	90	80-120	94	70-130	4	≤20
Chloroacetic acid	<0.4	<0.4	105	80-120	87	70-130	4	≤20
Dibromoacetic acid	<0.4	<0.4	94	80-120	82	70-130	3	≤20
Dichloroacetic acid	<0.4	<0.4	102	80-120	101	70-130	8	≤20
Trichloroacetic acid	<0.4	<0.4	111	80-120	95	70-130	6	≤20

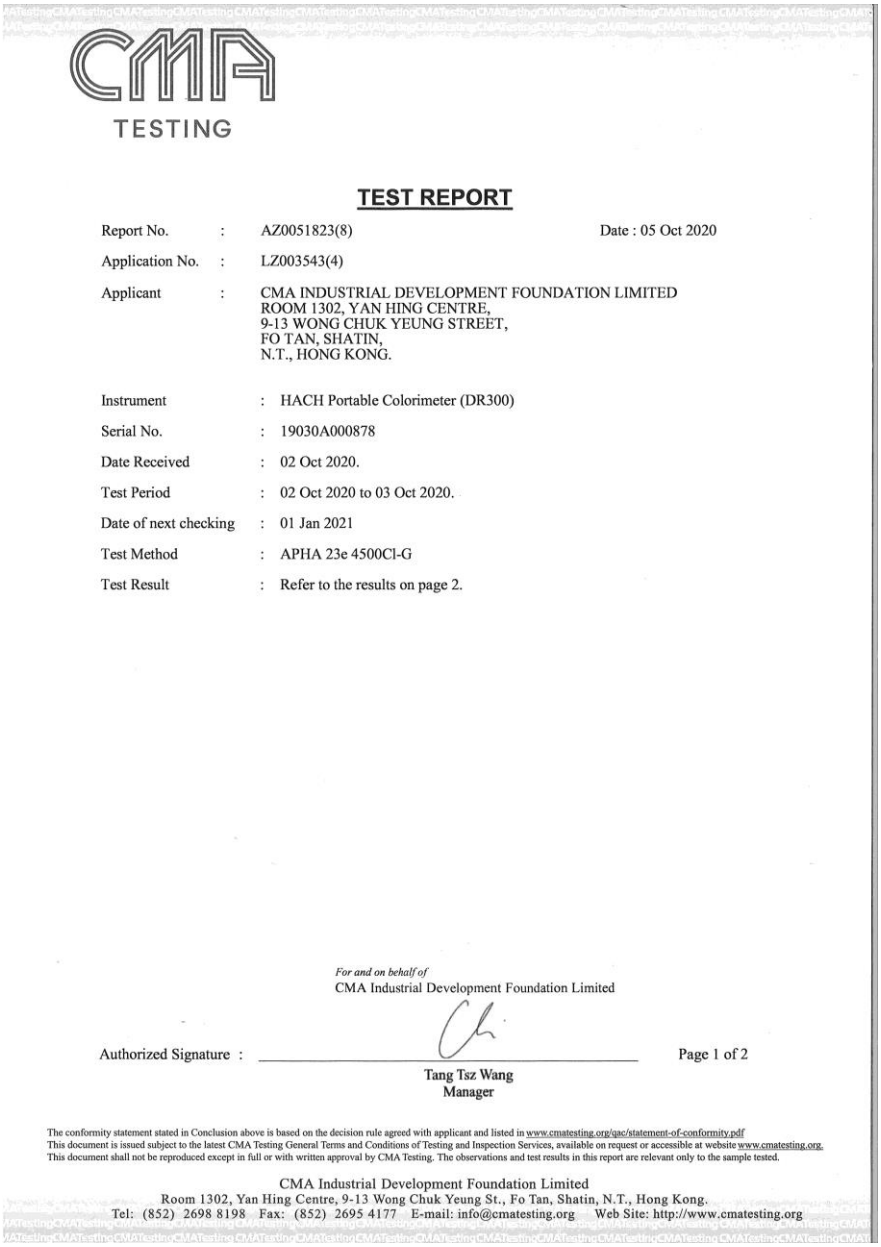
Parameter	(µg/L)	(µg/L)	(%)	(%)	(%)	(%)	(%)	(%)
Methylene chloride	<4	<4	95	80-120	114	70-130	9	≤20
Carbon tetrachloride	<0.1	<0.1	88	80-120	90	70-130	4	≤20
1,1-dichloroethane	<0.1	<0.1	92	80-120	113	70-130	3	≤20
1,2-dichloroethane	<0.1	<0.1	110	80-120	108	70-130	7	≤20
1,1-dichloroethylene	<0.1	<0.1	103	80-120	92	70-130	6	≤20
1,2-dichloropropane	<0.1	<0.1	105	80-120	87	70-130	6	≤20
Tetrachloroethylene	<0.1	<0.1	105	80-120	107	70-130	8	≤20
1,1,1-trichloroethane	<0.1	<0.1	88	80-120	86	70-130	5	≤20
1,1,2-trichloroethane	<0.1	<0.1	94	80-120	86	70-130	6	≤20
Trichloroethylene	<0.1	<0.1	92	80-120	92	70-130	4	≤20
2-chlorophenol	<0.1	<0.1	103	80-120	87	70-130	3	≤20
2,4-dichlorophenol	<0.1	<0.1	94	80-120	104	70-130	9	≤20
p-chloro-m-cresol	<0.1	<0.1	104	80-120	101	70-130	9	≤20
Pentachlorophenol	<0.1	<0.1	112	80-120	112	70-130	8	≤20
2,4,6-trichlorophenol	<0.1	<0.1	87	80-120	89	70-130	8	≤20
Bis(2-chloroethoxy) methane	<0.1	<0.1	109	80-120	91	70-130	6	≤20
Chlorobenzene	<0.1	<0.1	86	80-120	111	70-130	7	≤20
1,4-dichlorobenzene	<0.1	<0.1	110	80-120	102	70-130	2	≤20
Hexachlorobenzene	<0.005	<0.005	105	80-120	103	70-130	6	≤20
Hexachlorocyclopentadiene	<0.5	<0.5	106	80-120	110	70-130	3	≤20
Hexachloroethane	<0.1	<0.1	103	80-120	87	70-130	9	≤20
1,2,4-trichlorobenzene	<0.1	<0.1	97	80-120	92	70-130	4	≤20
Alpha-BHC	<0.005	<0.005	86	80-120	98	70-130	7	≤20
Beta-BHC	<0.005	<0.005	87	80-120	85	70-130	2	≤20
Gamma-BHC	<0.005	<0.005	98	80-120	102	70-130	5	≤20

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatesting.org Web Site: http://www.cmatesting.org

TEST REPORT

Report No. : AZ0051790(0) Date: 17 Nov 2020

Application No. : LZ023851(8)



TESTING

TEST REPORT

Report No.	:	AZ0051823(8)	Date : 05 Oct 2020
Application No.	:	LZ003543(4)	
Applicant	:	CMA INDUSTRIAL DEVELOPMENT FOUNDATION LIMITED ROOM 1302, YAN HING CENTRE, 9-13 WONG CHUK YEUNG STREET, FO TAN, SHATIN, N.T., HONG KONG.	
Instrument	:	HACH Portable Colorimeter (DR300)	
Serial No.	:	19030A000878	
Date Received	:	02 Oct 2020.	
Test Period	:	02 Oct 2020 to 03 Oct 2020.	
Date of next checking	:	01 Jan 2021	
Test Method	:	APHA 23e 4500Cl-G	
Test Result	:	Refer to the results on page 2.	

For and on behalf of
CMA Industrial Development Foundation Limited

Authorized Signature : _____ Page 1 of 2

Tang Tsz Wang
Manager

The conformity statement stated in Conclusion above is based on the decision rule agreed with applicant and listed in www.cmatesting.org/qac/statement-of-conformity.pdf
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CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
Tel: (852) 2698 8198 Fax: (852) 2695 4177 E-mail: info@cmatesting.org Web Site: http://www.cmatesting.org

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
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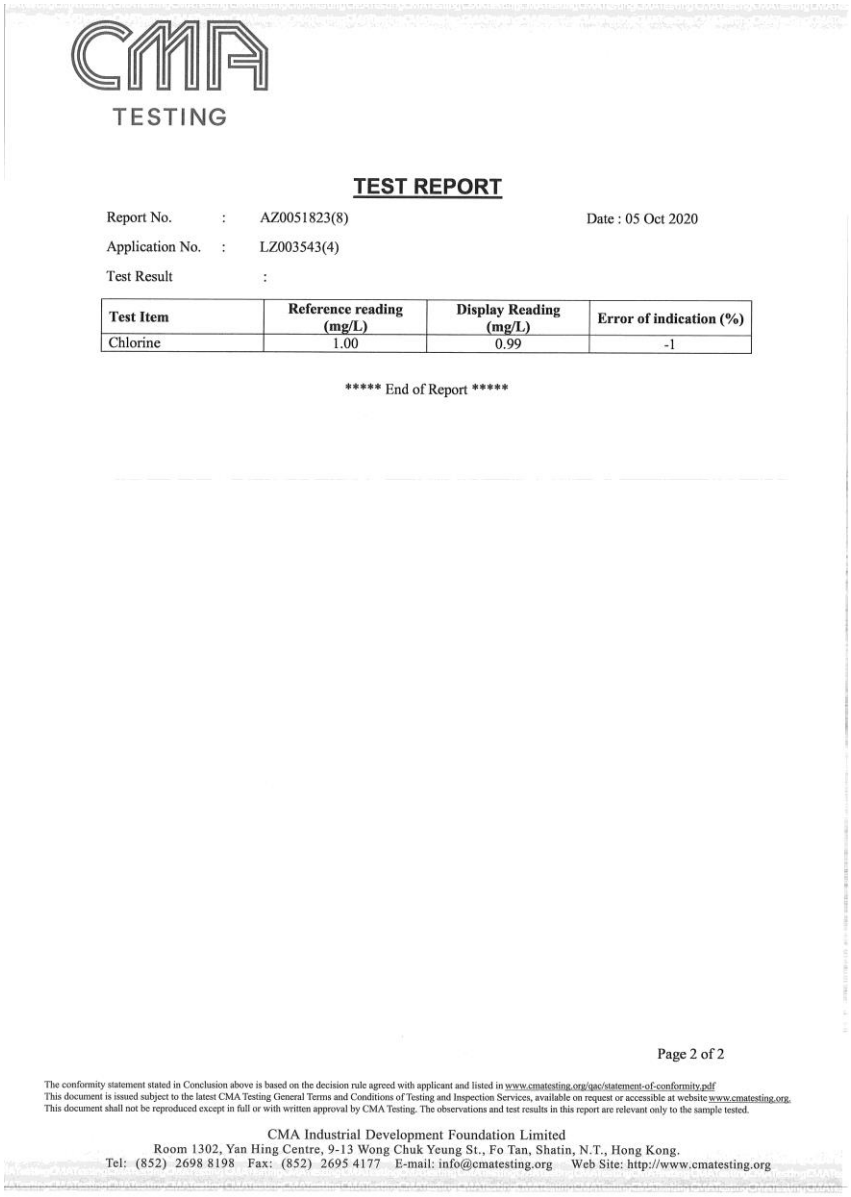
TEST REPORT

Report No. : AZ0051790(0) Date: 17 Nov 2020

Application No. : LZ023851(8)



TESTING

TEST REPORT

Report No. : AZ0051823(8) Date : 05 Oct 2020

Application No. : LZ003543(4)

Test Result :

Test Item	Reference reading (mg/L)	Display Reading (mg/L)	Error of indication (%)
Chlorine	1.00	0.99	-1

***** End of Report *****

Page 2 of 2

The conformity statement stated in Conclusion above is based on the decision rule agreed with applicant and listed in www.cmatesting.org/qac/statement-of-conformity.pdf
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Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
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***** End of Report *****

CMA Industrial Development Foundation Limited
Room 1302, Yan Hing Centre, 9-13 Wong Chuk Yeung St., Fo Tan, Shatin, N.T., Hong Kong.
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