CMA Testing and Certification Laboratories
廠商會檢定中心

# Term Contract for Provision of Sampling and Analyzing of Wastewater and Sludge for Various Sewage Treatment Facilities in Urban Area, Lantau and Outlying Islands to the Drainage Services Department

Contract No. : DE/2016/12

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 : LW012099(0)

Report Number : AW0029414(9)

Report Issued Date : 5 June 2018

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@cmatcl.com Web Site: http://www.cmatcl.com

# 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/2016/12 "Term Contract for Provision of Sampling and analysing of Wastewater and Sludge Samples for Various Sewage Treatment Facilities in Urban Area, Lantau and Outlying Islands to the Drainage Services Department (2017-2019)''. This report documented the results and findings of Operation Phase Environmental Monitoring works conducted for Effluent Quality Monitoring (EQM) of Project in Apr 2018.

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 | 23 Apr 2018 to 24 Apr 2018 | 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 23 Apr 2018 to 24 Apr 2018.



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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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## 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. Chlorination By-Products (CBPs) and Contaminants of Concern (COCs) 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 23 Apr 2018 to 10:00am of 24 Apr 2018 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 CBPs and COCs as shown in **Table 2.1.**

**Table 2.1 Analytical Methods for Laboratory Analysis for Effluent Samples**

| Parameters | | Analytical Method | Limit of Reporting (µg/L) |
|---|---|---|---|
| **Potential CBPs** | | | |
| Bromoform | Tri-halomethanes (THMs) | TG-ENV-WW-78 (Headspace GC-MS) | 0.1 |
| Bromodichloromethane | | | 0.1 |
| Chloroform | | | 0.1 |
| Dibromochloromethane | | | 5 |
| Bromoacetic acid | Haloacetic Acids (HAAs) | TG-ENV-WW-79 (GC-ECD) | 2 |
| Chloroacetic acid | | | 2 |





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| | | | |
|---|---|---|---|
| Dibromoacetic acid | | | 2 |
| Dichloroacetic acid | | | 2 |
| Trichloroacetic acid | | | 2 |
| **Contaminants of Concern (COCs)** | | | |
| Methylene chloride | Halogenated Aliphatics | TG-ENV-WW-78 (Headspace GC-MS) | 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 | Halogenated Aliphatics | | 0.5 |
| 1,1,2-trichloroethane | | | 0.5 |
| Trichloroethylene | | | 0.5 |
| 2-chlorophenol | Phenols & Haloethers | TG-ENV-WW-80 (GC-MS) | 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 | TG-ENV-WW-78 (Headspace GC-MS) | 0.5 |
| 1,4-dichlorobenzene | | | 0.5 |
| Hexachlorobenzene | | USEPA 625 | 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 |

## 3. RESULTS AND OBSERVATIONS

### Effluent Quality

3.1. The results of effluent quality monitoring conducted on the time period of 10:00am 23 Apr 2018 to 10:00am of 24 Apr 2018, whereas the laboratory testing and QC report are shown in **Appendix I- Report no. AW0029413(8).**



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**Appendix I - Report for Laboratory Test(s)**





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CMA Testing and Certification Laboratories
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# TEST REPORT

| | | | |
|---|---|---|---|
| Report No. | : | AW0029413(8) | Date: 5 June 2018 |
| Application No. | : | LW012099(0) | |
| Applicant | : | SEWAGE TREATMENT DIVISION 2<br>ELECTRICAL AND MECHANICAL BRANCH<br>DRAINAGE SERVICES DEPARTMENT<br>STONECUTTERS ISLAND SEWAGE TREATMENT WORKS.,<br>NGONG SHUNG ROAD, NGONG SHUEN CHAU,<br>KOWLOON, HONG KONG | |
| Contract No. | : | DE/2016/12 | |
| Project Name | : | Term Contract for Provision of Sampling and Analyzing of Wastewater and Sludge 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.<br>Sample was refrigerated during delivery. | |
| Sample ID | : | Refer to Sample ID on page 4. | |
| Sampling Location | : | SCISTW- Disinfection Facilities | |
| Sampling Date | : | 23 Apr 2018 to 24 Apr 2018. | |
| Date Received | : | 24 Apr 2018. | |
| Test Period | : | 24 Apr 2018 to 21 May 2018. | |

*For and on behalf of*
CMA Industrial Development Foundation Limited

Authorized Signature : _____

Lau Yan Kin
Senior Manager
Environmental Division





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# TEST REPORT

Report No. : AW0029413(8) Date: 5 June 2018

Application No. : LW012099(0)

Test Requested :

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





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# TEST REPORT

Report No. : AW0029413(8) Date: 5 June 2018

Application No. : LW012099(0)

Test Method :
1. TG-ENV-WW-78 (Headspace GC-MS)
2. TG-ENV-WW-78 (Headspace GC-MS)
3. TG-ENV-WW-78 (Headspace GC-MS)
4. TG-ENV-WW-78 (Headspace GC-MS)
5. TG-ENV-WW-79 (GC-ECD)
6. TG-ENV-WW-79 (GC-ECD)
7. TG-ENV-WW-79 (GC-ECD)
8. TG-ENV-WW-79 (GC-ECD)
9. TG-ENV-WW-79 (GC-ECD)
10. TG-ENV-WW-78 (Headspace GC-MS)
11. TG-ENV-WW-78 (Headspace GC-MS)
12. TG-ENV-WW-78 (Headspace GC-MS)
13. TG-ENV-WW-78 (Headspace GC-MS)
14. TG-ENV-WW-78 (Headspace GC-MS)
15. TG-ENV-WW-78 (Headspace GC-MS)
16. TG-ENV-WW-78 (Headspace GC-MS)
17. TG-ENV-WW-78 (Headspace GC-MS)
18. TG-ENV-WW-78 (Headspace GC-MS)
19. TG-ENV-WW-78 (Headspace GC-MS)
20. TG-ENV-WW-80 (GC-MS)
21. TG-ENV-WW-80 (GC-MS)
22. TG-ENV-WW-80 (GC-MS)
23. TG-ENV-WW-80 (GC-MS)
24. TG-ENV-WW-80 (GC-MS)
25. TG-ENV-WW-80 (GC-MS)
26. TG-ENV-WW-78 (Headspace GC-MS)
27. TG-ENV-WW-78 (Headspace GC-MS)
28. USEPA 625
29. USEPA 625
30. USEPA 625
31. USEPA 625
32. USEPA 625
33. USEPA 625
34. USEPA 625

Test Result : Refer to results on page 4.





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# TEST REPORT

Report No. : AW0029413(8) Date: 5 June 2018

Application No. : LW012099(0)

Effluent Water Quality

| | | |
|---|---|---|
| Application No:. | LW012099 | |
| Sampling Date | 23-Apr-18 to 24-Apr-18 | |
| Monitoring Location | Chamber 15A | |
| | | |
| | | |
| Parameter | Results (mg/L) | |
| Total Residual Chlorine | <0.01 | |
| Parameter | Results (µg/L) | |
| Bromoform | 1.0 | |
| Bromodichloromethane | 1.3 | |
| Chloroform | 10.7 | |
| Dibromochloromethane | <5 | |
| Bromoacetic acid | <2 | |
| Chloroacetic acid | <2 | |
| Dibromoacetic acid | 5.2 | |
| Dichloroacetic acid | 19.5 | |
| Trichloroacetic acid | 14.9 | |
| | | |
| 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 | <0.5 | |
| 1,1,1-trichloroethane | <0.5 | |
| 1,1,2-trichloroethane | <0.5 | |
| Trichloroethylene | <0.5 | |
| 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 | |





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# TEST REPORT

Report No. : AW0029413(8)

Date: 5 June 2018

Application No. : LW012099(0)

QC Report

Sampling Date 23-Apr-18 to 24-Apr-18

| 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 | 103 | 80-120 | 113 | 70-130 | 6 | ≤20 |
| Bromodichloromethane | <0.02 | <0.02 | 105 | 80-120 | 94 | 70-130 | 4 | ≤20 |
| Chloroform | <0.02 | <0.02 | 107 | 80-120 | 106 | 70-130 | 7 | ≤20 |
| Dibromochloromethane | <1 | <1 | 94 | 80-120 | 109 | 70-130 | 3 | ≤20 |
| Bromoacetic acid | <0.4 | <0.4 | 95 | 80-120 | 104 | 70-130 | 3 | ≤20 |
| Chloroacetic acid | <0.4 | <0.4 | 102 | 80-120 | 91 | 70-130 | 8 | ≤20 |
| Dibromoacetic acid | <0.4 | <0.4 | 93 | 80-120 | 98 | 70-130 | 7 | ≤20 |
| Dichloroacetic acid | <0.4 | <0.4 | 108 | 80-120 | 103 | 70-130 | 6 | ≤20 |
| Trichloroacetic acid | <0.4 | <0.4 | 97 | 80-120 | 108 | 70-130 | 1 | ≤20 |

| Parameter | (µg/L) | (µg/L) | (%) | (%) | (%) | (%) | (%) | (%) |
|---|---|---|---|---|---|---|---|---|
| Methylene chloride | <4 | <4 | 96 | 80-120 | 92 | 70-130 | 3 | ≤20 |
| Carbon tetrachloride | <0.1 | <0.1 | 92 | 80-120 | 95 | 70-130 | 9 | ≤20 |
| 1,1-dichloroethane | <0.1 | <0.1 | 98 | 80-120 | 98 | 70-130 | 6 | ≤20 |
| 1,2-dichloroethane | <0.1 | <0.1 | 96 | 80-120 | 93 | 70-130 | 4 | ≤20 |
| 1,1-dichloroethylene | <0.1 | <0.1 | 95 | 80-120 | 106 | 70-130 | 3 | ≤20 |
| 1,2-dichloropropane | <0.1 | <0.1 | 103 | 80-120 | 102 | 70-130 | 5 | ≤20 |
| Tetrachloroethylene | <0.1 | <0.1 | 107 | 80-120 | 96 | 70-130 | 5 | ≤20 |
| 1,1,1-trichloroethane | <0.1 | <0.1 | 107 | 80-120 | 104 | 70-130 | 4 | ≤20 |
| 1,1,2-trichloroethane | <0.1 | <0.1 | 92 | 80-120 | 109 | 70-130 | 6 | ≤20 |
| Trichloroethylene | <0.1 | <0.1 | 98 | 80-120 | 103 | 70-130 | 2 | ≤20 |
| 2-chlorophenol | <0.1 | <0.1 | 95 | 80-120 | 93 | 70-130 | 8 | ≤20 |
| 2,4-dichlorophenol | <0.1 | <0.1 | 104 | 80-120 | 98 | 70-130 | 6 | ≤20 |
| p-chloro-m-cresol | <0.1 | <0.1 | 105 | 80-120 | 104 | 70-130 | 1 | ≤20 |
| Pentachlorophenol | <0.1 | <0.1 | 93 | 80-120 | 103 | 70-130 | 9 | ≤20 |
| 2,4,6-trichlorophenol | <0.1 | <0.1 | 106 | 80-120 | 107 | 70-130 | 6 | ≤20 |
| Bis(2-chloroethoxy) methane | <0.1 | <0.1 | 95 | 80-120 | 102 | 70-130 | 5 | ≤20 |
| Chlorobenzene | <0.1 | <0.1 | 101 | 80-120 | 109 | 70-130 | 3 | ≤20 |
| 1,4-dichlorobenzene | <0.1 | <0.1 | 106 | 80-120 | 106 | 70-130 | 6 | ≤20 |
| Hexachlorobenzene | <0.005 | <0.005 | 94 | 80-120 | 106 | 70-130 | 7 | ≤20 |
| Hexachlorocyclopentadiene | <0.5 | <0.5 | 92 | 80-120 | 92 | 70-130 | 4 | ≤20 |
| Hexachloroethane | <0.1 | <0.1 | 104 | 80-120 | 97 | 70-130 | 3 | ≤20 |
| 1,2,4-trichlorobenzene | <0.1 | <0.1 | 96 | 80-120 | 103 | 70-130 | 3 | ≤20 |
| Alpha-BHC | <0.005 | <0.005 | 98 | 80-120 | 98 | 70-130 | 3 | ≤20 |
| Beta-BHC | <0.005 | <0.005 | 106 | 80-120 | 101 | 70-130 | 4 | ≤20 |
| Gamma-BHC | <0.005 | <0.005 | 105 | 80-120 | 94 | 70-130 | 7 | ≤20 |

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





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