



Appendix 6-2

Supplementary Baseline Water Quality Monitoring Result

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Report No.: 0088/19/ED/0173A

Monitoring Report for Additional Water Quality Baseline Survey

Client : Drainage Services Department

Project : Contract No. PM 02/2016 Water Quality Baseline Survey
for Drainage Improvement Works in Yuen Long, Stage 1
- Additional Water Quality Baseline Survey

Prepared by: Jason C. Y. Man

Reviewed by: Cyrus C. Y. Lai

Certified by:

A handwritten signature in black ink, appearing to be "C. Yung", written over a horizontal line.

Colin K. L. Yung
Project Manager
Fugro Technical Services Limited

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1. Introduction

- 1.1 Atkins China Ltd (ACL) was commissioned by DSD in November 2013 to undertake an Investigation, Design and Construction Consultancy entitled "Agreement No. CE 22/2013 (DS) Drainage Improvement Works in Yuen long, Stage 1 – Investigation, Design and Construction (hereinafter called the Assignment).
- 1.2 The Assignment includes an Environmental Impact Assessment (EIA) study namely Drainage Improvement Works Near Four Villages in Yuen Long - Sung Shan New Village, Tai Wo, Lin Fa Tei and Ha Che with Project Profile (PP-515/2014) and EIA Study Brief (ESB-279/2014).
- 1.3 Baseline water quality monitoring has been carried out 3 times per week, for two consecutive weeks from 11st to 21st October, 2016 (19th to 31st October, 2016 for TW2A) for wet season and from 22 November to 2 December, 2016 for dry season.
- 1.4 However, in order to provide the most up-to-date accurate baseline conditions, a supplementary water quality survey is required. Fugro Technical Services Limited (FTS) was appointed as the monitoring team for the additional water quality baseline survey.
- 1.5 This report summarizes the monitoring requirement and test monitoring results for additional water quality baseline survey, in accordance with Environmental Impact Assessment – Supplementary Water Quality Monitoring Plan and Methodology for Additional Water Quality Baseline Survey (Ref.: 0088/19/ED/0150).



2. Water Quality Monitoring Requirement

2.1 Monitoring Parameters and Frequency

2.1.1 In accordance with Section 2.3 of Supplementary Water Quality Monitoring Plan, the monitoring parameters for the additional water quality baseline survey are summarized in **Table 2.1**.

Table 2.1 Monitoring Parameters

In-situ Monitoring	Laboratory Analysis
Temperature (in °C) ,pH, Turbidity (in NTU), Dissolved Oxygen (in mg/L and %), Salinity (in ppt), Water Flow (in L/s or m ³ /s) ¹	Suspended Solids (SS), BOD ₅ , E. coli, COD, Ammonia-N (in mg/L), Nitrite-N (in mg/L), Nitrate (in mg/L), Total Kjeldahl Nitrogen (in mg/L), Ortho- phosphorus (in mg/L), Total Phosphorus (in mg/L), Cadmium (in µg/L), Chromium (in µg/L), Copper (in µg/L), Lead (in µg/L), Mercury (in µg/L), Nickel (in µg/L), Arsenic (in µg/L), Zinc (in µg/L), Silver (in µg/L)

Remark: ¹water flow is calculated by multiplying water velocity (in average) (m/s) by river cross-sectional area (m²).

2.1.2 The measurement shall be taken at the designated monitoring locations one time. Duplicate measurements of in-situ parameters shall be taken. Duplicate water samples for laboratory testing shall also be collected during monitoring event.

2.2 Monitoring Location

2.2.1 In accordance with Section 2.1 of Supplementary Water Quality Monitoring Plan, the additional water quality baseline survey should be carried out at 4 designed monitoring locations at streams, which are presented in **Table 2.2**. The monitoring locations of additional water quality baseline survey are also shown in **Appendix A**.

Table 2.2 Location of Water Quality Monitoring

Monitoring Locations	Type of WSR	Description
SSNV2	Stream	Downstream of Sung Shan New Village (SSNV) Nullah
TW1	Stream	Cheung Po River south tributary at Tai Wo
LFT2	Stream	Kam Tin River South Lin Fa Tei (LFT) Tributary
HC2	Stream	Downstream of Ha Che (HC) Nullah

2.2.2 Monitoring shall be taken at mid-depth of the water in the middle of the streams.

2.3 Monitoring Equipment

2.3.1 The following equipment and facilities shall be used for the additional water quality baseline survey:

DO and Temperature Measurement

- 2.3.2 The instrument should be a portable and weatherproof DO measuring instrument complete with cable and sensor, and use a DC power source. The equipment should be capable of measuring:
- a DO level in the range of 0 - 20 mg/ L and 0 - 200% saturation; and
 - a temperature of 0 - 45 degree Celsius.
- 2.3.3 It should have a membrane electrode with automatic temperature compensation complete with a cable. Sufficient stocks of spare electrodes and cables should be available for replacement where necessary.
- 2.3.4 Should salinity compensation not be built-in to the DO equipment, in-situ salinity should be measured to calibrate the DO equipment prior to each DO measurement.

Turbidity Measurement

- 2.3.5 Turbidity should be measured in-situ by the nephelometric method. The instrument should be portable and weatherproof using a DC power source complete with cable, sensor and comprehensive operation manuals. It should have a photoelectric sensor capable of measuring turbidity between 0 - 1000 NTU (for example, Hach model 2100P or an approved similar instrument). The cable should not be less than 25m in length. The meter should be calibrated in order to establish the relationship between NTU units and the levels of suspended solids. The turbidity measurement should be carried out on split water sample collected from the same depths of suspended solids samples.

pH Measurement

- 2.3.6 The pH measurement instrument shall consist of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It shall be readable to pH 0.1 in a range of 0 to 14. Standard buffer solutions of at least pH 7 to pH 10 shall be used for calibration of the instrument before and after use. Details of the method shall comply with APHA, 19th ed. 4500-HTB.

Water Sampling Equipment

- 2.3.7 A water sampler comprises a transparent PVC cylinder, with a capacity of not less than 2 litres, and could be effectively sealed with latex cups at both ends shall be used. The sampler has a positive latching system to keep it open and prevent premature closure until it is released by a messenger when the sampler is at the selected water depth (Kahlsico Water Sampler or other approved instrument).



2.3.8 Water samples shall be collected in plastic bottles, packed in ice (cooled to 4°C without being frozen), and delivered to the laboratory as soon as possible after collection. Types and volume of sample container and preservatives used (if any) are displayed in Table 4.1. Each bottle shall be labelled on the surface with location, parameter and replicate information of the sample. The holding time for sample is 24 hours after collection of water sample.

2.3.9 The equipment employed for the monitoring and sampling and their specifications are presented in **Table 2.3** and **Table 2.4**.

Table 2.3 Container Types for Holding Water Samples

Test Parameter	Container Type (Preservation)
SS, BOD ₅ , NO ₂ -N, NO ₃ -N	1 x 2 L Plastic Bottle (none)
NH ₃ -N, COD, Total Kjeldahl Nitrogen, Ortho-phosphate, Total Phosphorus	1 x 2 L Plastic Bottle (H ₂ SO ₄)
Heavy Metals	1 x 180 mL Plastic Bottle (NHO ₃)
E. coli	1 x 100 mL Sterilized Plastic Bottle (Na ₂ S ₂ O ₃)

Table 2.4 Water Quality Monitoring and Sampling Equipment

Parameter	Equipment	Model	Range	Equipment Accuracy
Temperature, Dissolved Oxygen, salinity, pH, Turbidity, Sampling Depth	Water Quality Monitoring Device	YSI EXO3 Sonde	Temp: -5 to 50°C DO: 0-50mg/L DO%: 0-500% Sal: 0 to 70 ppt pH: 0 to 14 pH units Turb: 0-4000NTU Depth: 0-100 meters	Temp: ±0.2°C DO: 0-200%: ±1% reading or 1% air sat., whichever is greater; 200-500%: ±5% reading 0-20 mg/L: ±1% of reading or 0.1 mg/L; 20-50 mg/L: ±5% reading (with correction for salinity and temperature) Sal: ±1% or 0.1ppt (whichever greater) pH: ±0.2 units Turb: 0-999 FNU: 0.3 NTU or ±2% of reading, whichever is greater; 1000-4000 NTU: ±5% of reading Depth: ±0.04m
Water Flow	Digital Handheld Water Velocity Meters	Global Water FP 211	Range: 0.1-6.1m/s	Accuracy: 0.1 m/s
Water Sampling	Water Sampler	Aquatic Research Transparent PC Vertical Water Sampler 2.2L / 3L / 5L	NA	NA

2.4 Equipment Calibration

- 2.4.1 All in-situ monitoring instruments shall be checked, calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme before use, and subsequently re-calibrated at 3 months intervals throughout the water quality monitoring programme. Responses of sensors and electrodes shall be checked with certified standard solutions before each use. Certificate for calibration of in-situ instruments shall also be provided for auditing. Copies of calibration certificates for the water quality monitoring equipment are attached in **Appendix B**.
- 2.4.2 Wet bulb calibration for a DO probe shall be carried out at least once per monitoring day. A zero check in distilled water shall be performed with the turbidity probe at least once per monitoring day. The probe shall then be calibrated with a solution of known NTU. In addition, the turbidity probe shall be calibrated at least twice per month to establish the relationship between turbidity readings (in NTU) and levels of suspended solids (in mgL-1).
- 2.4.3 For the on-site calibration of field equipment, the BS 1427: 1993, Guide to Field and On Site Test Methods for the Analysis of Waters should be observed. Sufficient stocks of spare parts shall be maintained for replacements when necessary. Backup monitoring equipment shall also be made available so that monitoring is uninterrupted even when some equipment is under maintenance or calibration etc.

2.5 Monitoring Operation

- 2.5.1 The water samples should be decanted from the water sampler into the water sample bottles. The bottles should be labelled, tightly sealed, placed into a cool-box and packed with ice ready for delivery to the laboratory.
- 2.5.2 Two consecutive measurements of water quality data, including pH, salinity, dissolved oxygen and turbidity shall be recorded according to the monitoring locations. Separate deployment of the monitoring instruments and water samplers shall be conducted for the consecutive measurements or samplings. The monitoring location / position, time, water depth, sampling depth, weather conditions, water condition and any special phenomena or work underway nearby shall also be recorded. If the difference in value between the first and second measurement of DO or turbidity parameters is more than 25% of the value of the first reading, the reading shall be discarded and further readings should be taken.



2.6 Laboratory Measurement / Analysis

HOKLAS Accreditation

2.6.1 Fugro Technical Services Limited is HOKLAS accredited laboratory. Sufficient water samples shall be collected at the monitoring stations for carrying out the laboratory measurement and analysis. The laboratory determination work shall start within 24 hours after collection of the water samples. The analysis for laboratory measurement is summarized in **Table 2.5**.

Table 2.5 Laboratory Measurement/Analysis Method and Reporting Limits

Analysis Description	Method	Reporting limits
Suspended Solid	APHA 17e 2540 D	0.5 mg/L
Ammonia Nitrogen	APHA 4500 NH3:H	0.025 mg/L
Nitrite Nitrogen	APHA 4500 NO2:A & NO3:F	0.002 mg/L
Nitrate Nitrogen	APHA 4500-NO3: E & F	0.002 mg /L
E.coli	DoE (1983) Sect. 7.8 & 7.9 plus in-situ urease test	1cfu/100mL
BOD5	APHA 5210B	1 mg/L
COD	APHA 5220B	2 mg/L
Total Kjeldahl Nitrogen	APHA 4500-Norg B	0.05 mg N/L
Ortho-phosphate phosphorus	APHA 4500-P G	0.002 mg/L
Total Phosphorus	APHA 4500-P B & G	0.02 mg/L
Cd	USEPA 6020A	0.2 µg/L
Hg	USEPA 6020A	0.5 µg/L
Cr, Cu, Ni, Pb, As & Ag	USEPA 6020A	1 µg/L
Zn	USEPA 6020A	10 µg/L

Quality Assurance / Quality Control

2.6.2 The laboratory incorporates a variety of QA/QC monitoring programme into their testing system. Where applicable or available, the quality of the analysis shall be monitored by conducting the following QC analysis:

For each batch of 20 samples:

- A minimal of 1 laboratory method blank shall be analyzed;
- A minimal of 1 sample duplicate shall be analyzed;
- A minimal of 1 sample matrix spike shall be analyzed.



3. Monitoring Results and Observations

- 3.1.1 Additional water quality baseline survey was conducted on 23 August 2019, from 11:10 to 14:38. According to the record from the Hong Kong Observatory, no rainfall records were observed two consecutive days before the sampling date. Although a slight rainfall was recorded on 23 August 2019, the weather was overall cloudy. No rain was observed during the monitoring period for the additional water quality baseline survey. The meteorological information between 21 August and 23 August 2019 is summarized in **Appendix C**.
- 3.1.2 No particular observation was recorded during the monitoring period except murky water was observed at LFT2 (Kam Tin River South LFT Tributary) and HC2 (Downstream of HC Nullah). Also, unexpected rapidly flowing water was found at HC2 during the monitoring period. Photo records at the 4 designated monitoring locations for the additional water quality baseline survey are given in **Appendix D**.
- 3.1.3 In-situ monitoring results and laboratory analysis results for the additional water quality baseline survey are presented in **Appendix E**.

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Appendix A Monitoring Location for Additional Water Quality Baseline Survey

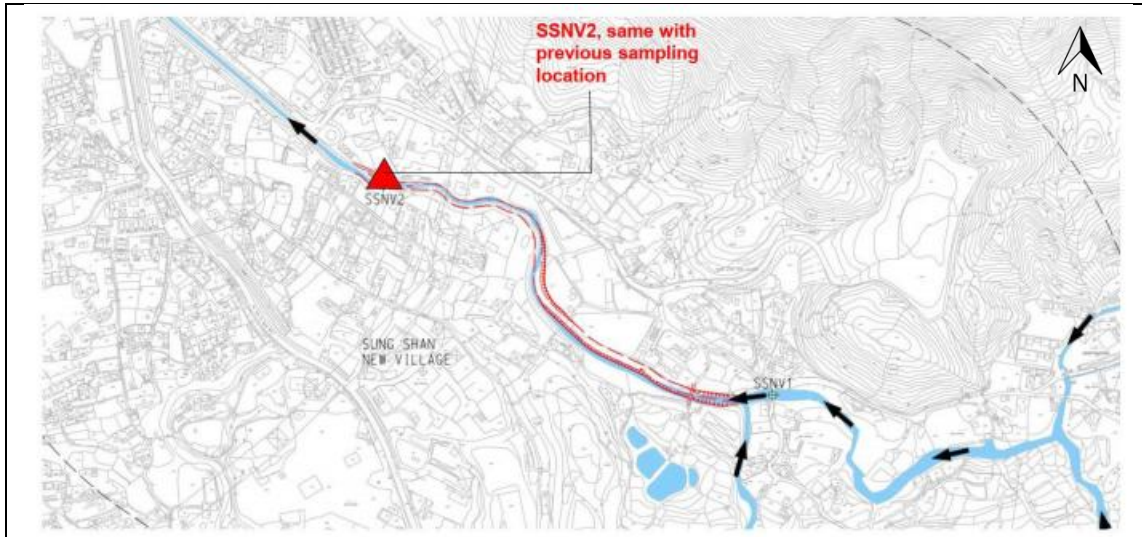
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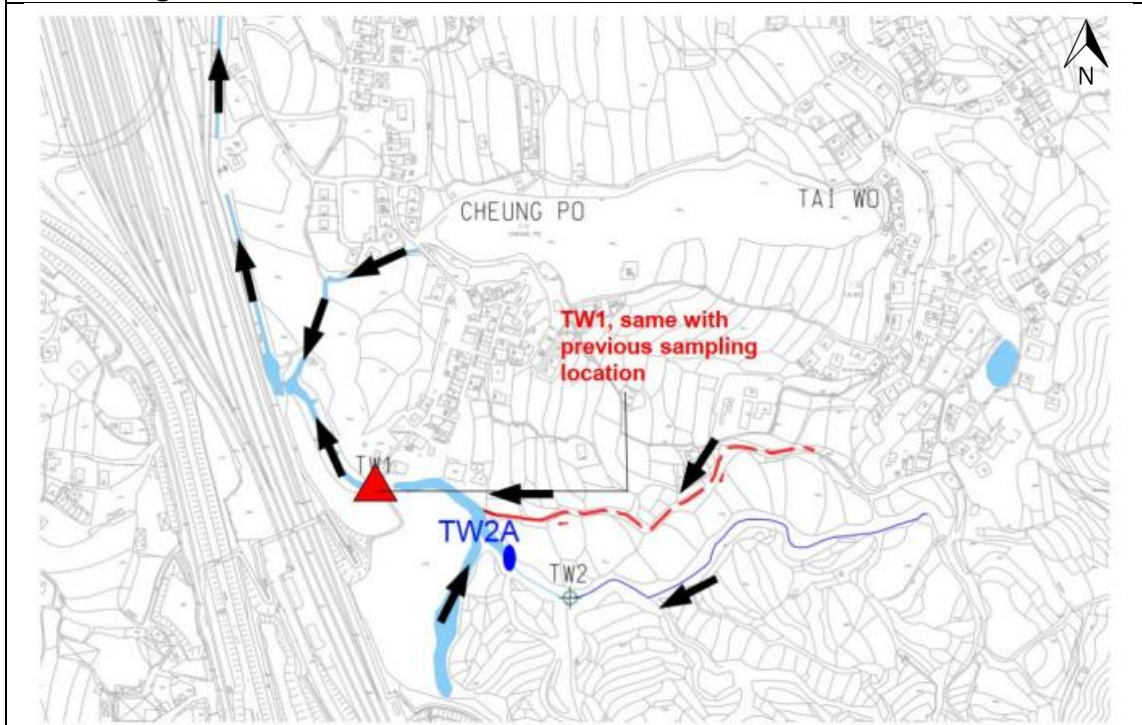
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Monitoring Location at SSNV2 - Downstream of SSNV Nullah



Monitoring Location at TW1 - Cheung Po River south tributary

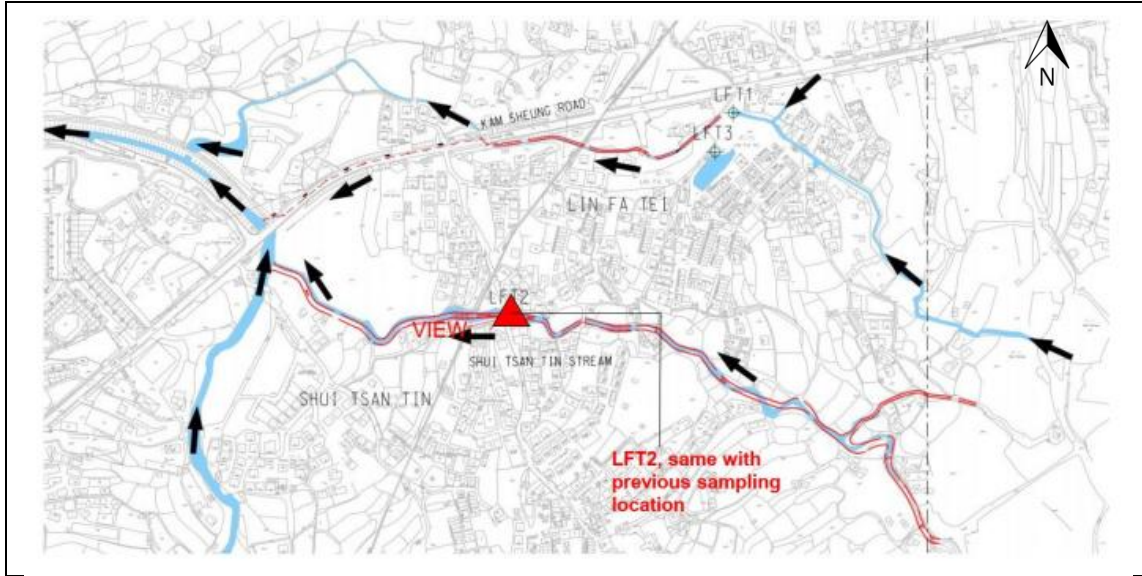
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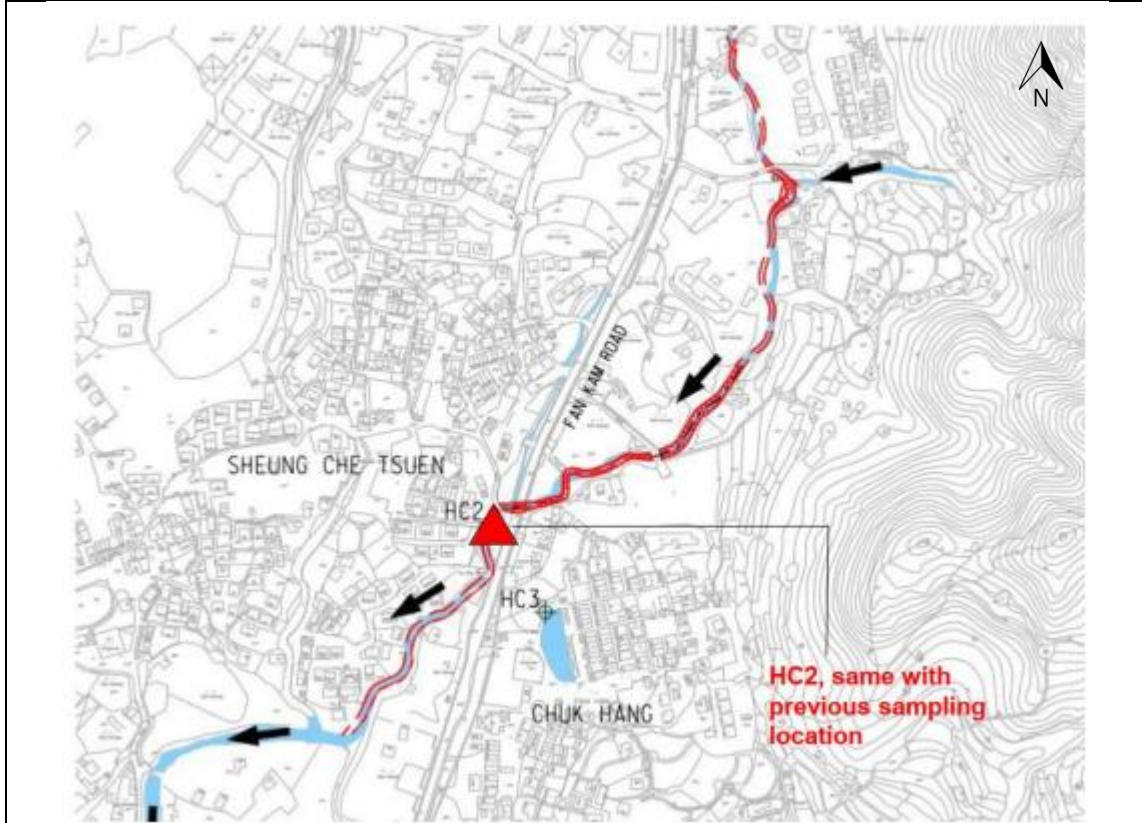
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Monitoring Location at LFT2 - Kam Tin River South LFT Tributary at Tai Wo



Monitoring Location at HC2 - Downstream of HC Nullah

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Appendix B

Copies of Calibration Certificates for the Water Quality Monitoring Equipment

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Report on Calibration of YSI EXO-3 Multi-parameter Water Quality Meter

Information Supplied by Client

Client : Fugro Technical Services Limited (MCL)
Client's address : Rm. 723-726, 7/F, Profit Industrial Building, No. 1-15,
Kwai Fung Crescent, Kwai Chung, N.T.
Sample description : One YSI EXO-3 Multi-parameter Water Quality Meter
Client sample ID : Serial No. 19E100633
Test required : Calibration of the YSI EXO-3 Multi-parameter Water Quality Meter

Laboratory Information

Lab. sample ID : WA191408/3
Date sample received : 21/06/2019
Date of calibration : 28/06/2019
Next calibration date : 27/09/2019
Test method used : In-house comparison method

Note : This report refers only to the sample(s) tested.

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Results :**A. pH calibration**

pH reading at 22°C for Q.C. solution(6.86) and at 22°C for Q.C. solution(9.18)		
Theoretical	Measured	Deviation
9.18	9.18	0.00
6.86	6.76	-0.10

B. Salinity calibration

Salinity, ppt			
Theoretical	Measured	Deviation	Maximum acceptable Deviation
10	10.1	+0.1	± 0.5
20	20.2	+0.2	± 1.0
30	30.1	+0.1	± 1.5
40	40.4	+0.4	± 2.0

C. Dissolved Oxygen calibration

Trial No.	Dissolved oxygen content, mg/L	
	By Titration	By D.O. meter
1	7.87	7.91
2	8.10	7.96
3	7.83	8.00
Average	7.93	7.96

Differences of D.O. Content between Wrinkler Titration and D.O. meter should be less than 0.2 mg/L

Remark : This report is to supersede our former report #142626WA191408(2).

Certified by :


Approved Signatory : HO Kin Man, John
Assistant General Manager – Laboratories

Date :

6/8/2019

Note : This report refers only to the sample(s) tested.

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Results :

D. Temperature calibration

Thermometer reading, °C	Meter reading, °C
23.0	22.83

E. Turbidity calibration

Turbidity, N.T.U.			
Theoretical	Measured	Deviation	Maximum acceptable Deviation
0	0.0	0.0	± 0.5
4	4.4	+0.4	± 0.6
8	8.2	+0.2	± 0.8
40	41.1	+1.1	± 3.0
80	80.2	+0.2	± 4.0

Remark : This report is to supersede our former report #142626WA191408(2).

Certified by : 
Approved Signatory : HO Kin Man, John
Assistant General Manager – Laboratories

Date : 6/8/2019
** End of Report **

Note : This report refers only to the sample(s) tested.

WATER

Certification of Quality

This product has been tested in accordance with procedures established through Global Water Instrumentation's Quality Management System. This product meets or exceeds its manufacturing acceptance criteria.

ITEM DESCRIPTION:	Flow Probe, 5.5 - 14'
MODEL NAME/ NUMBER:	FP211
PART NUMBER:	BB1100
SERIAL NUMBER:	1931002343
ACCURACY:	± 0.1 FPS (0.03 MPS)
POWER REQUIRED:	Internal Lithium Coin Cell Battery
CABLE LENGTH:	N/A
CERTIFICATES:	CE Compliant
RANGE:	0.3 - 19.9 FPS (0.1 - 6.1 MPS)
OUTPUT:	Flow Display, FPS/MPS
CALIBRATION FACTOR:	310

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Water Quality

Weather

Remote Monitoring

Control

Technician *Garcia, Monica*

Inspector *Garcia, Monica*

Date *8/2/2019*

NOTE: Global Water Instrumentation warrants that its products are free from defects in material & workmanship under normal use & service for a period of one year from date of original shipment from factory. Repaired components are warranted for a period of 90 days from shipment. Contact us for complete warranty details.



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Appendix C

Meteorological Information during the Monitoring Period

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Date	Mean Pressure (hPa)	Air Temperature			Mean Relative Humidity (%)	Total Rainfall (mm)
		Maximum (deg. C)	Mean (deg. C)	Minimum (deg. C)		
August 2019						
21	1005.9	32.8	29.5	27.6	74	0.0
22	1006.6	33.0	29.7	27.5	77	0.0
23	1006.7	31.4	29.4	28.2	80	0.7

Source: Hong Kong Observatory

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Appendix D

Photo Records at the Monitoring Locations for Additional Water Quality Baseline Survey

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Monitoring Location at SSNV2 - Downstream of SSNV Nullah



Monitoring Location at TW1 - Cheung Po River south tributary

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Monitoring Location at LFT2 - Kam Tin River South LFT Tributary at Tai Wo



Monitoring Location at HC2 - Downstream of HC Nullah

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Appendix E

In-situ Monitoring Results and Laboratory Analysis Results

Water Quality Monitoring Results

Monitoring Location		SSNV2		TW1		LFT2		HC2		
Date		23-Aug-19								
Weather		Cloudy								
Time		14:38		13:47		11:10		11:57		
River Depth (m)		0.28		0.05		0.16		0.29		
River Width (m)		3.50		1.10		2.26		2.10		
Replicate		1	2	1	2	1	2	1	2	
In-situ Measurement	pH	Value	6.87	6.83	7.41	7.40	7.16	7.15	7.53	7.50
		Ave.	6.85		7.41		7.16		7.52	
	Salinity (ppt)	Value	0.05	0.05	0.06	0.06	0.08	0.08	0.07	0.07
		Ave.	0.05		0.06		0.08		0.07	
	Temperature (°C)	Value	29.10	29.10	28.67	28.65	28.37	28.38	29.00	29.10
		Ave.	29.10		28.66		28.38		29.05	
	DO Saturation (%)	Value	66.3	65.8	93.6	94.1	60.4	60.1	78.8	78.7
		Ave.	66.1		93.9		60.3		78.8	
	DO (mg/L)	Value	5.09	5.05	7.24	7.28	4.69	4.67	6.06	6.04
		Ave.	5.07		7.26		4.68		6.05	
	Turbidity (NTU)	Value	18.7	18.8	6.6	6.7	40.3	40.7	54.4	54.5
		Ave.	18.8		6.7		40.5		54.5	
	Water Flow (m ³ /s)	Value	0.097	0.111	0.000	0.000	0.050	0.053	0.670	0.635
		Ave.	0.104		0.000		0.052		0.653	

- Notes: 1. Water flow (m³/s) is calculated by multiplying water velocity (in average) (m/s) by river cross-section area (m²).
 2. Murky water was observed at LFT2 and HC2. Unexpected rapidly flowing water was found at HC2.
 3. River depth is taken by the average of river depth (m) throughout the cross-section of the river.

Water Quality Monitoring Results

Monitoring Location			SSNV2										TW1									
Date			23-Aug-19																			
Weather			Cloudy																			
Time			14:38										11:10									
Replicate			1					2					1					2				
In-situ Measurement	Cumulative River Width (m)	Value	0.00	1.00	2.00	3.00	3.50	0.00	1.00	2.00	3.00	3.50	0.00	0.25	0.50	0.75	1.10	0.00	0.25	0.50	0.75	1.10
	River Depth (m)	Value	0.26	0.20	0.30	0.30	0.33	0.23	0.21	0.31	0.30	0.33	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	Water Velocity (m/s)	Value	0.00	0.00	0.52	0.00	0.00	0.05	0.02	0.39	0.09	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Ave.	0.104					0.118					0.000					0.000				
	Cross-sectional Area (m ²)	Value	0.94					0.94					0.06					0.06				
Water Flow (m ³ /s)	Value	0.097					0.111					0.000					0.000					

Monitoring Location			LFT2										HC2									
Date			23-Aug-19																			
Weather			Cloudy																			
Time			13:47										11:57									
Replicate			1					2					1					2				
In-situ Measurement	Cumulative River Width (m)	Value	0.00	0.26	1.00	2.00	2.26	0.00	0.26	1.00	2.00	2.26	0.00	0.50	1.00	1.50	2.10	0.00	0.50	1.00	1.50	2.10
	River Depth (m)	Value	0.09	0.18	0.28	0.18	0.09	0.08	0.20	0.25	0.17	0.09	0.08	0.21	0.47	0.40	0.31	0.08	0.23	0.44	0.39	0.31
	Water Velocity (m/s)	Value	0.15	0.15	0.12	0.12	0.06	0.09	0.17	0.13	0.12	0.08	0.12	0.76	1.25	1.40	1.46	0.15	0.75	1.21	1.35	1.35
		Ave.	0.122					0.118					1.000					0.962				
	Cross-sectional Area (m ²)	Value	0.41					0.45					0.67					0.66				
Water Flow (m ³ /s)	Value	0.050					0.053					0.670					0.635					

- Notes: 1. Water flow (m³/s) is calculated by multiplying water velocity (in average) (m/s) by river cross-section area (m²).
 2. Unexpected rapidly flowing water was found at HC2.

Water Quality Monitoring Results

Monitoring Location		SSNV2		TW1		LFT2		HC2		
Date		23-Aug-19								
Weather		Cloudy								
Time		14:38		13:47		11:10		11:57		
Water Depth (m)		0.28		0.05		0.16		0.29		
River Width (m)		3.50		1.10		2.26		2.10		
Replicate		1 2		1 2		1 2		1 2		
Laboratory Analysis	Suspended Solids (mg/L)	Value	18	17	3	4	11	10	55	54
		Ave.	18		4		11		55	
	BOD ₅ (mg/L)	Value	6.2	6.4	<1	<1	2.1	3.0	5.7	6.1
		Ave.	6.3		1.0		2.6		5.9	
	<i>E.coli</i>	Value	48,000	62,000	1,300	1,400	36,000	39,000	1.2E+06	1.1E+06
		Ave.	55,000		1,350		37,500		1,150,000	
	COD (mg/L)	Value	15	16	7	5	15	15	47	48
		Ave.	16		6		15		48	
	Ammonia-N (mg/L)	Value	0.84	0.78	0.07	0.06	3.80	3.80	0.79	0.72
		Ave.	0.81		0.07		3.80		0.76	
	Nitrite-N (mg/L)	Value	0.15	0.14	0.01	0.01	0.40	0.42	0.10	0.09
		Ave.	0.15		0.01		0.41		0.10	
	Nitrate-N (mg/L)	Value	0.53	0.50	0.08	0.06	1.60	1.50	0.44	0.42
		Ave.	0.52		0.07		1.55		0.43	
	Total Kjeldahl Nitrogen (mg/L)	Value	1.80	1.80	0.66	0.64	4.60	4.30	2.90	2.90
		Ave.	1.80		0.65		4.45		2.90	
	Ortho-phosphorus (mg/L)	Value	0.290	0.320	0.013	0.009	0.860	0.920	0.140	0.120
		Ave.	0.305		0.011		0.890		0.130	
	Total Phosphorus (mg/L)	Value	0.37	0.39	0.10	0.11	1.00	0.95	0.32	0.27
		Ave.	0.38		0.11		0.98		0.30	
	Cadmium (µg/L)	Value	0.23	<0.2	<0.2	0.46	<0.2	<0.2	<0.2	<0.2
		Ave.	0.2		0.3		0.2		0.2	
	Chromium (µg/L)	Value	<1	<1	<1	<1	<1	<1	<1	<1
		Ave.	1		1		1		1	
	Copper (µg/L)	Value	3	4	1	1	4	3	4	4
		Ave.	4		1		4		4	
	Lead (µg/L)	Value	1	1	<1	1	<1	1	<1	<1
		Ave.	1		1		1		1	
Mercury (µg/L)	Value	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
	Ave.	0.5		0.5		0.5		0.5		
Nickel (µg/L)	Value	<1	<1	<1	<1	1	<1	2	2	
	Ave.	1		1		1		2		
Arsenic (µg/L)	Value	1	1	4	4	<1	<1	1	1	
	Ave.	1		4		1		1		
Zinc (µg/L)	Value	44	36	36	21	50	47	54	44	
	Ave.	40		29		49		49		
Silver (µg/L)	Value	<1	<1	<1	<1	<1	<1	<1	<1	
	Ave.	1		1		1		1		

Note: If the monitoring result is lower than its reporting limit, the result is regarded as its reporting limit for calculation of the average value.

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MateriaLab

Report No. : 181172WA191833



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Test Report on Analysis of Water

Information Supplied by Client

Client : Drainage Services Department
Client's address : 42/F, Revenue Tower, 5 Gloucester Road, Wan Chai, Hong Kong
Project : Contract No. PM 02/2016 Water Quality Baseline Survey for
Drainage Improvement Works in Yuen Long, Stage 1 – Additional
Water Quality Baseline Survey
Sample description : Eight samples of water taken by the staff of FTS on 23/08/2019
Client sample ID : Refer to result pages
Tests required : Total suspended solids dried at 103°C - 105°C
Ammonia Nitrogen content
Nitrite Nitrogen content
Nitrate Nitrogen content
Biochemical oxygen demand
Chemical oxygen demand
Total Kjeldahl nitrogen content
Reactive phosphorus content
Total phosphorus content
E.Coli Count
Cadmium content
Chromium content
Copper content
Mercury content
Nickel content
Lead content
Silver content
Zinc content
Arsenic content

Note : This report refers only to the sample(s) tested.

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Report No. : 181172WA191833

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Laboratory Information

Lab. sample ID	Chemical tests	Microbiological tests
	WA191833/1-8	WA191833/1B-8B

Sample condition	Chemical tests	Microbiological tests
Container	Sixteen 2L plastic bottles	Eight 250mL plastic bottles with thiosulphate added
Appearance	Colorless	
Temperature	Cooled	

Temperature : 6.9°C

Date of receipt of sample : 23/08/2019

Date test commenced : 23/08/2019

Date test completed : 04/09/2019

Test methods used : Total suspended solids dried at 103°C - 105°C
 APHA 17ed. 2540-D
 Ammonia Nitrogen content
 APHA 23ed. 4500-NH₃H
 Nitrite Nitrogen content
 APHA 20ed. 4500-NO₂ A & NO₃ F
 Nitrate Nitrogen content
 APHA 20ed. 4500-NO₃ E & F
 Biochemical oxygen demand
 APHA 23ed. 5210 B
 Chemical oxygen demand
 APHA 18ed. 5220 B
 Total Kjeldahl nitrogen content
 APHA 17ed. 4500-N_{org} B
 Reactive phosphorus content
 APHA 17ed. 4500-P G
 Total phosphorus content
 APHA 17ed. 4500-P B & G
 E. coli count
The Bacteriological Examination of Drinking Water Supplies
 1982, DoE (1983) *Membrane Filtration Procedure: Sections 7.8,*
7.9.4.2 Bacterial Confirmation: Section 7.9.4.4 & in-situ urease
test
 Cadmium content, Chromium content, Copper content, Mercury
 content, Nickel content, Lead content, Silver content, Zinc content
 & Arsenic content
 USEPA 6020A

Note : This report refers only to the sample(s) tested.

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MaterialLab

Report No. : 181172WA191833

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Results :

Test parameters	Sample identification								Reporting Limit
	TW1	TW1/Dup	HC2	HC2/Dup	LFT2	LFT2/Dup	SSNV2	SSNV2/Dup	
1. Total suspended solids dried at 103°C - 105°C, mg/L	3	4	55	54	11	10	18	17	0.5
2. Ammonia Nitrogen content, mg/L	0.07	0.06	0.79	0.72	3.8	3.8	0.84	0.78	0.025
3. Nitrite Nitrogen content, mg/L	0.01	0.01	0.10	0.09	0.40	0.42	0.15	0.14	0.002
4. Nitrate Nitrogen content, mg/L	0.08	0.06	0.44	0.42	1.6	1.5	0.53	0.50	0.002
5. Biochemical oxygen demand, mg/L	<1	<1	5.7	6.1	2.1	3.0	6.2	6.4	1
6. Chemical oxygen demand, mg/L	7	5	47	48	15	15	15	16	2
7. Total Kjeldahl nitrogen content, mg/L	0.66	0.64	2.9	2.9	4.6	4.3	1.8	1.8	0.05
8. Reactive phosphorus content, mg/L	0.013	0.009	0.14	0.12	0.86	0.92	0.29	0.32	0.002
9. Total phosphorus content, mg/L	0.10	0.11	0.32	0.27	1.0	0.95	0.37	0.39	0.02

Remark: 1. Detailed information for BOD₅ test :

- i. Samples taken by staff of FTS on 22/08/2019
- ii. Samples stored at 0-4°C refrigerator prior to testing.
- iii. Date and hour of commencing BOD₅ test : 23/08/2019 15:30
- iv. The BOD₅ test was conducted without suppression of nitrification by ATU.
- v. Type of seeding water used was Polyseed BOD₅ seeding water.
- vi. The samples were incubated at 19-21°C for 5 days

Certified by: 
Approved Signatory : HO Kin Man, John
Assistant General Manager – Laboratories

Date : 06/09/2019

Note : This report refers only to the sample(s) tested.

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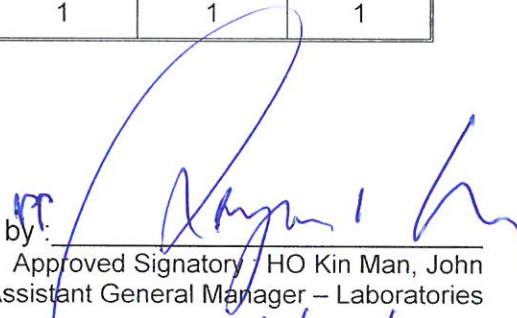
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Results :

Test parameters	Sample identification								Reporting Limit
	TW1	TW1/Dup	HC2	HC2/Dup	LFT2	LFT2/Dup	SSNV2	SSNV2/Dup	
10. E. coli count, cfu/100ml	1.3×10^3	1.4×10^3	1.2×10^6	1.1×10^6	3.6×10^4	3.9×10^4	4.8×10^4	6.2×10^4	1
11. Cadmium content, µg/L	<0.2	0.46	<0.2	<0.2	<0.2	<0.2	0.23	<0.2	0.2
12. Chromium content, µg/L	<1	<1	<1	<1	<1	<1	<1	<1	1
13. Copper content, µg/L	1	1	4	4	4	3	3	4	1
14. Mercury content, µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
15. Nickel content, µg/L	<1	<1	2	2	1	<1	<1	<1	1
16. Lead content, µg/L	<1	1	<1	<1	<1	1	1	1	1
17. Silver content, µg/L	<1	<1	<1	<1	<1	<1	<1	<1	1
18. Zinc content, µg/L	36	21	54	44	50	47	44	36	10
19. Arsenic content, µg/L	4	4	1	1	<1	<1	1	1	1

Certified by:


Approved Signatory / HO Kin Man, John
Assistant General Manager – Laboratories

Date

06/09/2019

** End of Report **

Note : This report refers only to the sample(s) tested.