Appendix F Water Quality Equipment Calibration Certificate

ALS Technichem (HK) Pty Ltd
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N.T., Hong Kong
T: +852 2610 1044 | F: +852 2610 2021

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR NELSON TSUI	WORK ORDER:	HK1917914
CLIENT:	ACUITY SUSTAINABILITY CONSULTING LIMITED		
ADDRESS:	1908, iPLACE, NOS. 301-305 CASTLE PEAK ROAD, KWAI CHUNG, NEW TERRITORIES, HONG KONG	SUB-BATCH: LABORATORY: DATE RECEIVED: DATE OF ISSUE:	0 HONG KONG 30-Apr-2019 09-May-2019

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.

The "Next Calibration Date" is recommended according to best practice principle as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Dissolved Oxygen, pH Value, Turbidity, Salinity, Redox Potential and Temperature
Equipment Type:	Multifunctional Meter
Brand Name:	HORIBA
Model No.:	U-5000 Multiparameter Water Quality Meter
Serial No.:	--
Equipment No.:	BGYP9CKD
Date of Calibration:	09-May-2019

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Mr Chan Siu Ming, Vico
Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK1917914

SUB-BATCH: 0
DATE OF ISSUE: 09-May-2019
CLIENT: ACUITY SUSTAINABILITY CONSULTING LIMITED

Equipment Type: Multifunctional Meter
Brand Name: HORIBA
Model No.: U-5000 Multiparameter Water Quality Meter
Serial No.: --
Equipment No.: BGYP9CKD
Date of Calibration: 09-May-2019 Date of Next Calibration: 09-Aug-2019

PARAMETERS:

Dissolved Oxygen Method Ref: APHA (21st edition), 4500-O: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
8.10	8.11	+0.01
5.57	5.42	-0.15
3.15	3.06	-0.09
	Tolerance Limit (mg/L)	±0.20

pH Value Method Ref: APHA (21st edition), 4500H:B

Expected Reading (pH unit)	Displayed Reading (pH unit)	Tolerance (pH unit)
4.0	3.94	-0.06
7.0	7.06	+0.06
10.0	9.87	-0.13
	Tolerance Limit (pH unit)	±0.20

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr Chan Siu Ming, Vico
Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK1917914

SUB-BATCH: 0
DATE OF ISSUE: 09-May-2019
CLIENT: ACUITY SUSTAINABILITY CONSULTING LIMITED

Equipment Type: Multifunctional Meter
Brand Name: HORIBA
Model No.: U-5000 Multiparameter Water Quality Meter
Serial No.: --
Equipment No.: BGYP9CKD
Date of Calibration: 09-May-2019 Date of Next Calibration: 09-Aug-2019

PARAMETERS:

Turbidity

Method Ref: APHA (21st edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.33	--
4	4.21	+5.3
40	42.3	+5.7
80	81.3	+1.6
400	402	+0.5
800	845	+5.6
	Tolerance Limit (%)	±10.0

Salinity

Method Ref: APHA (21st edition), 2520B

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.0	--
10	9.8	-2.0
20	19.7	-1.5
30	29.9	-0.3
	Tolerance Limit (%)	±10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr Chan Siu Ming, Vico
Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK1917914

SUB-BATCH: 0
DATE OF ISSUE: 09-May-2019
CLIENT: ACUITY SUSTAINABILITY CONSULTING LIMITED

Equipment Type: Multifunctional Meter
Brand Name: HORIBA
Model No.: U-5000 Multiparameter Water Quality Meter
Serial No.: --
Equipment No.: BGYP9CKD
Date of Calibration: 09-May-2019 Date of Next Calibration: 09-Aug-2019

PARAMETERS:

Temperature Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (^{o}C)	Displayed Reading (^{o}C)	Tolerance (^{o}C)
9.5	10.11	+0.6
19.0	19.45	+0.4
38.5	39.05	+0.5
	Tolerance Limit (^{o}C)	±2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr Chan Siu Ming, Vico
Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK1917914

SUB-BATCH: 0
DATE OF ISSUE: 09-May-2019
CLIENT: ACUITY SUSTAINABILITY CONSULTING LIMITED

Equipment Type: Multifunctional Meter
Brand Name: HORIBA
Model No.: U-5000 Multiparameter Water Quality Meter
Serial No.: --
Equipment No.: BGYP9CKD
Date of Calibration: 09-May-2019 Date of Next Calibration: 09-Aug-2019

PARAMETERS:

Redox Potential

Method Ref: APHA (21st edition), 2580B
Method Ref: Orion Research Instruction Manual and the Laboratory Manual the Environmental of Water, Wastewater and Soil (2nd edition), Rump & Krist (1992)

Expected Reading (mV)	Displayed Reading (mV)	Difference of A and B (mV)
Solution A (~234mV)	68	
Solution B (~300mV)	115	+47.0
	Tolerance Limit (mV)	>66

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr Chan Siu Ming, Vico
Manager - Inorganic

專業化驗有限公司
QUALITY PRO TEST-CONSULT LIMITED
Unit 10, 14/F, Wah Wai Centre, 38-40 Au Pui Wan St., Fotan, Hong Kong
Email: info@qualityprotest.com; Website: www.qualityprotest.com
Tel: (852) 3956 8717; Fax: (852) 3956 3928

REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : AI070052
Date of Issue : 12 July, 2019

PART A – CUSTOMER INFORMATION

Acuity Sustainability Consulting Limited
Unit 1908, Nos. 301-305
Castle Peak Road, Kwai Chung
N.T., HK
Attn: Mr. Nelson TSUI

PART B – DESCRIPTION

Name of Equipment	:	YSI ProDSS (Multi-Parameters)
Manufacturer	:	YSI (a xylem brand)
Serial Number	:	15M101091
Date of Received	:	Jul 09, 2019
Date of Calibration	:	Jul 11, 2019
Date of Next Calibration[a]	:	Oct 11, 2019

PART C – REFERENCE METHODS/ DOCUMENTS FOR THE CALIBRATION

Parameter	Reference Method
pH at 25°C	APHA 21e 4500-H^+ B
Dissolved Oxygen	APHA 21e 4500-O G
Salinity	APHA 21e 2520 B
Turbidity	APHA 21e 2130 B
Temperature	Section 6 of international Accreditation New Zealand Technical Guide no. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

PART D – CALIBRATION RESULTS[b,c]

(1) pH at 25°C

Target (pH unit)	Displayed Reading[d] (pH Unit)	Tolerance[e](pH Unit)	Results
4.00	4.10	0.1	Satisfactory
7.42	7.28	-0.14	Satisfactory
10.01	10.10	0.09	Satisfactory

Tolerance of pH should be less than ±0.20 (pH unit)

(2) Temperature

Reading of Ref. thermometer (°C)	Displayed Reading (°C)	Tolerance (°C)	Results
15.0	15.0	0.0	Satisfactory
25.0	25.5	0.5	Satisfactory
52.0	53.7	1.7	Satisfactory

Tolerance limit of temperature should be less than ±2.0 (°C)

~ CONTINUED ON NEXT PAGE ~

Remark(s): -

(a) The "Date of Next Calibration" is recommended according to best practice principals as practiced by QPT or quoted form relevant international standards.
(b) The results relate only to the calibrated equipment as received
(c) The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.
(d) "Displayed Reading" denotes the figure shown on item under calibration/ checking regardless of equipment precision or significant figures.
(e) The "Tolerance Limit" mentioned is referenced to YSI product specifications.

LEE Chun-ning, Desmond
Senior Chemist

專業化驗有限公司
QUALITY PRO TEST-CONSULT LIMITED
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REPORT OF EQUIPMENT PERFORMANCE CHECK/ CALIBRATION

Report No. : AI070052
Date of Issue : 12 July, 2019

PART D – CALIBRATION RESULTS (Cont'd)

(3) Dissolved Oxygen

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)	Results
7.68	7.75	0.07	Satisfactory
5.81	5.71	-0.1	Satisfactory
3.20	3.38	0.18	Satisfactory
0.20	0.1	-0.10	Satisfactory

Tolerance limit of dissolved oxygen should be less than ±0.50 (mg/L)

(4) Salinity

Expected Reading (g/L)	Displayed Reading (g/L)	Tolerance (%)	Results
10	9.96	-0.4	Satisfactory
20	20.26	1.3	Satisfactory
30	30.97	3.2	Satisfactory

Tolerance limit of salinity should be less than ±10.0 (%)

(5) Turbidity

Expected Reading (NTU)	Displayed Reading[f] (NTU)	Tolerance[g] (%)	Results
0	0.24	--	Satisfactory
10	10.58	5.8	Satisfactory
20	20.00	0.0	Satisfactory
100	97.60	-2.4	Satisfactory
800	770.00	-3.8	Satisfactory

Tolerance limit of turbidity should be less than ±10.0 (%)

~ END OF REPORT ~

Remark(s): -

[f] "Displayed Reading" presents the figures shown on item under calibration/ checking regardless of equipment precision or significant figures.

[g] The "Tolerance Limit" mentioned is the acceptance criteria applicable for similar equipment used by Quality Pro Test-Consult Ltd. or quoted form relevant international standards.

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N.T., Hong Kong
T: +852 2610 1044 | F: +852 2610 2021

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR NELSON TSUI	WORK ORDER:	HK1923178
CLIENT:	ACUITY SUSTAINABILITY CONSULTING LIMITED		
ADDRESS:	1908, iPLACE, NOS. 301-305 CASTLE PEAK ROAD, KWAI CHUNG, NEW TERRITORIES, HONG KONG	SUB-BATCH: LABORATORY: DATE RECEIVED: DATE OF ISSUE:	0 HONG KONG 05-Jun-2019 21-Jun-2019

COMMENTS

The performance of the equipment stated in this report is checked with independent reference material and results compared against a calibrated secondary source.

The "Tolerance Limit" quoted is the acceptance criteria applicable for similar equipment used by the ALS Hong Kong laboratory or quoted from relevant international standards.

The "Next Calibration Date" is recommended according to best practice principle as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Dissolved Oxygen, pH Value, Turbidity, Salinity, Redox Potential and Temperature
Equipment Type:	Multifunctional Meter
Brand Name:	HORIBA
Model No.:	U-53
Serial No.:	UHB5F2BB
Equipment No.:	--
Date of Calibration:	14-Jun-2019

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.

Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

Mr Chan Siu Ming, Vico
Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK1923178

SUB-BATCH: 0
DATE OF ISSUE: 21-Jun-2019
CLIENT: ACUITY SUSTAINABILITY CONSULTING LIMITED

Equipment Type: Multifunctional Meter
Brand Name: HORIBA
Model No.: U-53
Serial No.: UHB5F2BB
Equipment No.: --
Date of Calibration: 14-Jun-2019 Date of Next Calibration: 14-Sep-2019

PARAMETERS:

Dissolved Oxygen Method Ref: APHA (21st edition), 4500-O: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
2.46	2.63	+0.17
5.46	5.51	+0.05
7.56	7.57	+0.01
	Tolerance Limit (mg/L)	±0.20

pH Value Method Ref: APHA (21st edition), 4500H:B

Expected Reading (pH unit)	Displayed Reading (pH unit)	Tolerance (pH unit)
4.0	3.96	-0.04
7.0	7.06	+0.06
10.0	10.06	+0.06
	Tolerance Limit (pH unit)	±0.20

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr Chan Siu Ming, Vico
Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

WORK ORDER: HK1923178

SUB-BATCH: 0
DATE OF ISSUE: 21-Jun-2019
CLIENT: ACUITY SUSTAINABILITY CONSULTING LIMITED

Equipment Type: Multifunctional Meter
Brand Name: HORIBA
Model No.: U-53
Serial No.: UHB5F2BB
Equipment No.: --
Date of Calibration: 14-Jun-2019 Date of Next Calibration: 14-Sep-2019

PARAMETERS:

Salinity

Method Ref: APHA (21st edition), 2520B

Expected Reading (ppt)	Displayed Reading (ppt)	Tolerance (%)
0	0.00	--
10	9.82	-1.8
20	19.06	-4.7
30	30.62	+2.1
	Tolerance Limit (%)	±10.0

Redox Potential

Method Ref: APHA (21st edition), 2580B
Method Ref: Orion Research Instruction Manual and the Laboratory Manual the Environmental of Water, Wastewater and Soil (2nd edition), Rump & Krist (1992)

Expected Reading (mV)	Displayed Reading (mV)	Difference of A and B (mV)
Solution A (~234mV)	226	
Solution B (~300mV)	293	+67.0
	Tolerance Limit (mV)	>66

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (^{o}C)	Displayed Reading (^{o}C)	Tolerance (^{o}C)
11.5	13.42	+1.9
23.0	24.94	+1.9
40.0	40.18	+0.2
	Tolerance Limit (^{o}C)	±2.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr Chan Siu Ming, Vico
Manager - Inorganic

REPORT OF EQUIPMENT CALIBRATION

WORK ORDER: HK1923178

SUB-BATCH: 0
DATE OF ISSUE: 21-Jun-2019
CLIENT: ACUITY SUSTAINABILITY CONSULTING LIMITED

Equipment Type: Multifunctional Meter
Brand Name: HORIBA
Model No.: U-53
Serial No.: UHB5F2BB
Equipment No.: --
Date of Calibration: 20-Jun-2019 Date of Next Calibration: 14-Sep-2019

PARAMETERS:
Turbidity Method Ref: APHA (21st edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.00	--
4	3.92	-2.0
40	39.1	-2.3
80	79.3	-0.9
400	392	-2.0
800	798	-0.3
	Tolerance Limit (%)	±10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr Chan Siu Ming, Vico
Manager - Inorganic

REPORT OF EQUIPMENT PERFORMANCE CHECK

WORK ORDER: HK1923178

SUB-BATCH: 0
DATE OF ISSUE: 21-Jun-2019
CLIENT: ACUITY SUSTAINABILITY CONSULTING LIMITED

Equipment Type: Multifunctional Meter
Brand Name: HORIBA
Model No.: U-53
Serial No.: UHB5F2BB
Equipment No.: --
Date of Calibration: 14-Jun-2019

PARAMETERS:
Turbidity

Method Ref: APHA (21st edition), 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.67	--
4	23.8	+495.0
40	150	+275.0
80	222	+177.5
400	729	+82.3
800	0.00	-100.0
	Tolerance Limit (%)	±10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr Chan Siu Ming, Vico
Manager - Inorganic