## Air Quality

## Calibration Certificates for Air Quality

## ALS Technichem (HK) Pty Ltd



ANALYTICAL CHEMISTRY & TESTING SERVICES



#### SUB-CONTRACTING REPORT

CONTACT

: MR K.W. FAN

WORK ORDER

HK2240047

CLIENT

: ENVIROTECH SERVICES CO.

SUB-BATCH

**ADDRESS** 

: RM 712, 7/F, MY LOFT 9 HOI WING ROAD,

DATE RECEIVED : 11-OCT-2022

TUEN MUN, N.T., HK

DATE OF ISSUE : 20-OCT-2022

NO. OF SAMPLES : 1

CLIENT ORDER

: 1

**PROJECT** 

#### General Comments

 Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in ambient condition. The result(s) related only to the item(s) tested.

- Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.
- Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified.
- Calibration was subcontracted to and analysed by Action-United Environmental Services & Consulting.

#### Signatories

This document has been signed by those names that appear on this report and are the authorised signatories

Signatories

Position

Richard Fung

Managing Director

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

All pages of this report have been checked and approved for release.

ALS Technichem (HK) Pty Ltd Part of the ALS Laboratory Group

11/F Chung Shun Knitting Centre 1 - 3 Wing Yip Street Kwai Chung N T Hong Kong Kwai Tsing Hong Kong

WORK ORDER

: HK2240047

SUB-BATCH

• 1

: ENVIROTECH SERVICES CO.

CLIENT PROJECT

\_\_\_\_\_\_

ALS

ALS Lab	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.	
HK2240047-001	S/N: 336338	Equipments	11-Oct-2022	S/N: 336338	

## **Equipment Verification Report (TSP)**

#### **Equipment Calibrated:**

Type:

Laser Dust monitor

Manufacturer:

Sibata LD - 3B

Serial No.

336338

Equipment Ref:

NA

Job Order

HK2240047

#### Standard Equipment:

Standard Equipment:

Higher Volume Sampler (TSP)

Location & Location ID:

AUES office (calibration room)

Equipment Ref:

HVS 018

Last Calibration Date:

13 September 2022

### **Equipment Verification Results:**

Verification Date:

14 October 2022

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in ug/m³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/min)
2hr15mins	09:33 ~ 11:48	26.9	1012.1	44.6	2621	19.5
2hr01 mins	11:51 ~ 13:52	26.9	1012.1	45.7	2722	22.6
2hr01 mins	13:55 ~ 15:56	26.9	1012.1	56.6	2922	24.1

60

50

30

20 10

#### Linear Regression of Y or X

Slope (K-factor):

2.2211 (µg/m<sup>3</sup>)/CPM

Correlation Coefficient (R)

0.9920

Date of Issue

17 October 2022

#### Remarks:

Strong Correlation (R>0.8) 1.

Factor 2.2211 (µg/m³)/CPM should be applied for TSP monitoring

\*If R<0.5, repair or re-verification is required for the equipment

Operator : \_\_\_\_\_ Fai So

Signature:

Date : <u>17 October 2022</u>

- 2.2211x - 0.0341

QC Reviewer : Ben Tam

Signature:

Date : <u>17 October 2022</u>

### TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location:

Gold King Industrial Building, Kwai Chung

Date of Calibration: 13-Sep-22

Location ID:

Calibration Room

Next Calibration Date: 13-Dec-22

#### CONDITIONS

Sea Lével Pressure (hPa) Temperature (°C)

1007.3 31.7

Corrected Pressure (mm Hg) Temperature (K)

755.475

#### **CALIBRATION ORIFICE**

Make-> TISCH Model-> 5025A Calibration Date-> 27-Dec-21

Ostd Slope -> Qstd Intercept -> Expiry Date->

#### CALIBRATION

1					인단			
	Plate	H20 (L)	H2O (R)	H20	Qstd	I	IC	LINEAR
	No.	(in)	(in)	(in)	(m3/min)	(chart)	corrected	REGRESSION
	18	6	6	12.0	1.714	54	53.24	Slope = 30.1792
ı	13	4.9	4.9	9.8	1.549	48	47.33	Intercept = 1.5486
ı	10	3.7	3.7	7.4	1.347	44	43.38	Corr. coeff. = 0.9961
ı	8	2.5	2.5	5.0	1.108	36	35.50	00000000000000000000000000000000000000
l	5	1.6	1.6	3.2	0.887	28	27.61	

#### Calculations:

Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]

IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

Qstd = standard flow rate

IC = corrected chart respones

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration ( deg K)

Pstd = actual pressure during calibration ( mm Hg )

#### For subsequent calculation of sampler flow:

1/m(( I )[Sqrt(298/Tav)(Pav/760)]-b)

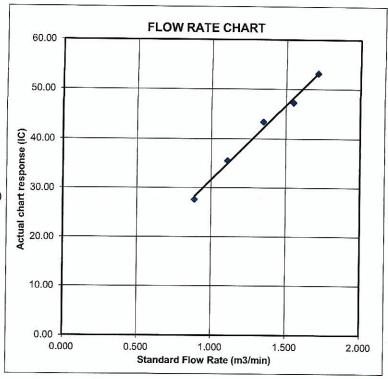
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pay = daily average pressure





## RECALIBRATION DUE DATE:

December 27, 2022

# Certificate of Calibration

**Calibration Certification Information** 

Cal. Date: December 27, 2021

Rootsmeter S/N: 438320

Ta: 295

Pa: 740.4

°K

Operator: Jim Tisch

Calibration Model #: TE-5025A

Calibrator S/N: 1612

mm Hg

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.3890	3.2	2.00
2	3	4	1	0.9760	6.4	4.00
3	5	6	1	0.8740	7.9	5.00
4	7	8	1	0.8320	8.8	5.50
5	9	10	1	0.6870	12.7	8.00

	Data Tabulation						
Vstd	Qstd	$\sqrt{\Delta H \left(\frac{Pa}{Pstd}\right) \left(\frac{Tstd}{Ta}\right)}$		Qa	$\sqrt{\Delta H(Ta/Pa)}$		
(m3)	(x-axis)	(y-axis)	Va	(x-axis)	(y-axis)		
0.9799	0.7055	1.4029	0.9957	0.7168	0.8927		
0.9756	0.9996	1.9841	0.9914	1.0157	1.2624		
0.9736	1.1140	2.2183	0.9893	1.1320	1.4114		
0.9724	1.1688	2.3265	0.9881	1.1876	1.4803		
0.9673	1.4079	2.8059	0.9828	1.4306	1.7853		
	m=	1.99838		m=	1.25135		
QSTD	b=	-0.00903	QA	b=	-0.00574		
	r=	0.99999	•	r=	0.99999		

	Calculation	ıs	
Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	Va=	ΔVol((Pa-ΔP)/Pa)
Qstd=	Vstd/ΔTime	Qa=	Va/∆Time
33.00	For subsequent flow rat	e calculatio	ns:
Qstd=	$1/m \left( \sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)} - b \right)$	Qa=	$1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$

	Standard Conditions	
Tstd:	298.15 °K	
Pstd:	760 mm Hg	
	Key	
ΔH: calibrator	manometer reading (in H2O)	
ΔP: rootsmete	er manometer reading (mm Hg)	
Ta: actual abs	olute temperature (°K)	
Pa: actual bar	ometric pressure (mm Hg)	
b: intercept		
m: slope		

#### RECALIBRATION

US EPA recommends annual recalibration per 1998
40 Code of Federal Regulations Part 50 to 51,
Appendix B to Part 50, Reference Method for the
Determination of Suspended Particulate Matter in
the Atmosphere, 9.2.17, page 30

Tisch Environmental, Inc. 145 South Miami Avenue Village of Cleves, OH 45002 www.tisch-env.cc

TOLL FREE: (877)263-761

FAX: (513)467-90

## Monitoring Schedule for Air Quality

## **Tung Chung New Town Extension (East)**

Air Quality Monitoring Schedule (September 2023)

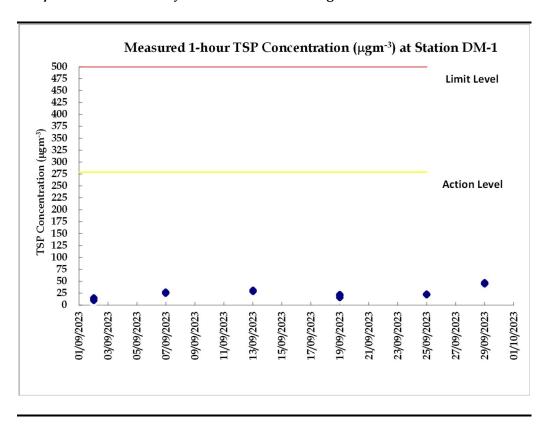
Sunday	Monday		Wednesday		Friday	Saturday
Cultural.					1-Sep	2-Sep
						Air Quality Monitoring
3-Sep	4-Sep	5-Sep	6-Sep	7-Sep	8-Sep	9-Sep
				Air Quality Monitoring		
10-Sep	11-Sep	12-Sep	13-Sep	14-Sep	15-Sep	16-Sep
			Air Quality Monitoring			
17-Sep	18-Sep	19-Sep	20-Sep	21-Sep	22-Sep	23-Sep
		Air Quality Monitoring				
24-Sep	25-Sep	26-Sep	27-Sep	28-Sep	29-Sep	30-Sep
	Air Quality Monitoring				Air Quality Monitoring	

# Monitoring Results for Air Quality

Table E3 Data for 1-hr TSP Monitoring at Station DM-1

Date	Start Time	Finish Time	Weather	1-hour TSP (μg/m³)
9/2/2023	15:00	16:00	Cloudy	10
9/2/2023	16:00	17:00	Cloudy	13
9/2/2023	17:00	18:00	Cloudy	15
9/7/2023	13:58	14:58	Cloudy	25
9/7/2023	14:58	15:58	Cloudy	27
9/7/2023	15:58	16:58	Cloudy	27
9/13/2023	13:20	14:20	Sunny	29
9/13/2023	14:20	15:20	Sunny	31
9/13/2023	15:20	16:20	Sunny	29
9/19/2023	13:04	14:04	Sunny	16
9/19/2023	14:04	15:04	Sunny	22
9/19/2023	15:04	16:04	Sunny	20
9/25/2023	13:04	14:04	Sunny	22
9/25/2023	14:04	15:04	Sunny	23
9/25/2023	15:04	16:04	Sunny	22
9/29/2023	9:03	10:03	Sunny	45
9/29/2023	10:03	11:03	Sunny	45
9/29/2023	11:03	12:03	Sunny	47

Figure E3 Graphical Presentation for 1-hr TSP Monitoring at Station DM-1



## Event and Action Plan for Air Quality

Annex E4 Event and Action Plan for Air Quality

Event	Action						
Event	ET	IEC	ER	Contractor			
Action level exceedance for one sample	<ol> <li>Identify source, investigate the causes of exceedance and propose remedial measures;</li> <li>Inform IEC and ER;</li> <li>Repeat measurement to confirm finding;</li> <li>Increase monitoring frequency to daily.</li> </ol>	<ol> <li>Check monitoring data submitted by ET;</li> <li>Check Contractor's working method.</li> </ol>	1. Notify Contractor.	<ol> <li>Rectify any unacceptable practice;</li> <li>Amend working methods if appropriate.</li> </ol>			
Action level exceedance for two or more consecutive samples	<ol> <li>Identify source;</li> <li>Inform IEC and ER;</li> <li>Advise the ER on the effectiveness of the proposed remedial measures;</li> <li>Repeat measurements to confirm findings;</li> <li>Increase monitoring frequency to daily;</li> <li>Discuss with IEC and Contractor on remedial actions required;</li> <li>If exceedance continues, arrange meeting with IEC and ER;</li> <li>If exceedance stops, cease additional monitoring.</li> </ol>	<ol> <li>Check monitoring data submitted by ET;</li> <li>Check Contractor's working method;</li> <li>Discuss with ET and Contractor on possible remedial measures;</li> <li>Advise the ET on the effectiveness of the proposed remedial measures;</li> <li>Supervise Implementation of remedial measures.</li> </ol>	<ul><li>failure in writing;</li><li>2. Notify Contractor;</li><li>3. Ensure remedial measures properly implemented.</li></ul>	<ol> <li>Submit proposals for remedial to ER within 3 working days of notification;</li> <li>Implement the agreed proposals;</li> <li>Amend proposal if appropriate.</li> </ol>			

Frank	Action						
Event	ET	IEC	ER	Contractor			
Limit level exceedance for one sample	<ol> <li>Identify source, investigate the causes of exceedance and propose remedial measures;</li> <li>Inform ER, Contractor and EPD;</li> <li>Repeat measurement to confirm finding;</li> <li>Increase monitoring frequency to daily;</li> <li>Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.</li> </ol>	<ol> <li>Check monitoring data submitted by ET;</li> <li>Check Contractor's working method;</li> <li>Discuss with ET and Contractor on possible remedial measures;</li> <li>Advise the ER on the effectiveness of the proposed remedial measures;</li> <li>Supervise implementation of remedial measures.</li> </ol>	<ul><li>failure in writing;</li><li>Notify Contractor;</li><li>Ensure remedial measures properly implemented.</li></ul>	<ol> <li>Take immediate action to avoid further exceedance;</li> <li>Submit proposals for remedial actions to IEC within 3 working days of notification;</li> <li>Implement the agreed proposals;</li> <li>Amend proposal if appropriate.</li> </ol>			
Limit level exceedance for two or more consecutive samples	<ol> <li>Notify IEC, ER, Contractor and EPD;</li> <li>Identify source;</li> <li>Repeat measurement to confirm findings;</li> <li>Increase monitoring frequency to daily;</li> <li>Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>Arrange meeting with IEC and ER to discuss the remedial actions to be taken;</li> <li>Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;</li> <li>If exceedance stops, cease additional monitoring.</li> </ol>	<ol> <li>Discuss amongst ER, ET, and Contractor on the potential remedial actions;</li> <li>Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;</li> <li>Supervise the implementation of remedial measures.</li> </ol>	<ol> <li>Confirm receipt of notification of failure in writing;</li> <li>Notify Contractor;</li> <li>In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>Ensure remedial measures properly implemented;</li> <li>If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</li> </ol>	<ol> <li>Take immediate action to avoid further exceedance;</li> <li>Submit proposals for remedial actions to IEC within 3 working days of notification;</li> <li>Implement the agreed proposals;</li> <li>Resubmit proposals if problem still not under control;</li> <li>Stop the relevant portion of works as determined by the ER until the exceedance is abated.</li> </ol>			