



ANNEX E

AIR QUALITY



ANNEX E1

CALIBRATION CERTIFICATES FOR AIR
QUALITY



SUB-CONTRACTING REPORT

CONTACT : MR MAGNUM FAN	WORK ORDER : HK2419606
CLIENT : ENVIROTECH SERVICES CO.	SUB-BATCH : 1
ADDRESS : RM 712, 7/F, MY LOFT 9 HOI WING ROAD, TUEN MUN, N.T. HK	DATE RECEIVED : 20-MAY-2024
PROJECT : ----	DATE OF ISSUE : 24-MAY-2024
	NO. OF SAMPLES : 1
	CLIENT ORDER : ----

General Comments

- 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. The result(s) is/are related only to the item(s) tested.
- Calibration was subcontracted to Envirotech Services Company.
- Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in ambient condition.

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 report supersedes any previous report(s) with the same work order number.

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

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WORK ORDER : HK2419606
SUB-BATCH : 1
CLIENT : ENVIROTECH SERVICES CO.
PROJECT : ----



ALS Lab ID	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK2419606-001	Sibata LD 3B (436560)	Equipments	11-May-2024	S/N: 436560

----- END OF REPORT -----



Equipment Verification Report (TSP)

Equipment Calibrated:

Type: Laser Dust Monitor
Manufacturer: Sibata LD-3B
Serial No.: 436560
Equipment Ref.: N/A
ALS Job Order: HK2418944

Standard Equipment

Standard Equipment: High Volume Sampler (TSP)
Location: Envirotech Room (Calibration Room)
Equipment Ref.: HVS 8162
Last Calibration Date: 25-Mar-2024

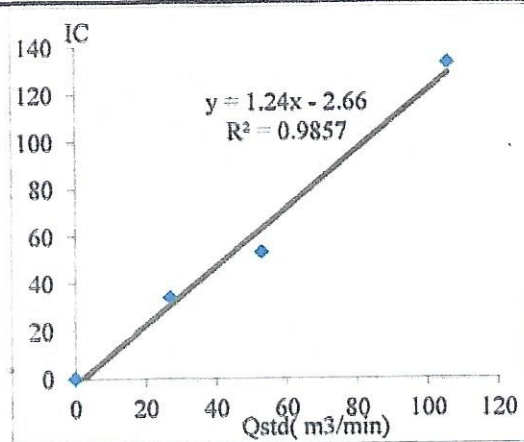
Equipment Verification Results:

Verification Date: 11-May-2024

Hour	Time	Mean Temp °C	Mean Pressure (hpa)	Concentration in µg/m³ (Standard Equipment) (Y-Axis)	Concentration in µg/m³ (Calibrated Equipment) (X-Axis)
1hr 00mins	0830-0930	26.8	1015	34	27
2hr 00mins	0935-1135	28.5	1015	53	53
3hr 00mins	1310-1610	29.5	1016	133	106

Linear Regression of Y or X

Slope (K-factor): 1.2400(µg/m³)/CPM
Correlation Coefficient (R): 0.9928
Date of Issue: 19-May-2024



Remarks:

- 1. Strong Correlation (>0.8)
- 2. Factor 1.2400(µg/m³)/CPM should be applied for TSP monitoring

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

Operator: P.F.Yeung Signature Tai Date: 19 May 2024
QC Reviewer: K.F.Ho Signature Ho Date: 19 May 2024

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Rm. 712, My Loft, Tuen Mun	Date of Calibration: 25-Mar-24
HVS ID: 8162	Next Calibration Date: 24-May-24
Name and Model : TISCH HVS Model TE-5170	Operator: P.F. Yeung

CONDITIONS

Sea Level Pressure (hpa)	1016	Corrected Pressure (mm Hg)	762.1
Temperature (°C)	24.5	Temperature (K)	297.5

CALIBRATION ORIFICE

Make:	TISCH	Qstd Slope	2.07544
Model:	TE-5025A	Qstd Intercept	-0.03205
Serial#:	2454		

CALIBRATION

Plate No.	H2O(L) (in)	H2O(R) (in)	H2O (in)	Qstd (m3/min)	I (chart)	IC (corrected)	LINEAR REGRESSION Slope= 30.471 Intercept= 5.514 Corr. Coeff.= 0.9994
18	6.7	6.8	13.5	1.790	60	60.15	
13	5.5	5.6	11.1	1.625	55	55.13	
10	4.3	4.5	8.8	1.448	49	49.12	
7	2.5	2.7	5.2	1.117	40	40.10	
5	1.5	1.7	3.2	0.879	32	32.08	

Calculations:

$$Qstd = 1/m[\text{Sqrt}(H2O(Pa/Pstd)(Tstd/Ta))-b]$$

$$IC = I[\text{Sqrt}(Pa/Pstd)(Tstd/Ta)]$$

Qstd = standard flow rate

IC = corrected chart response

I = actual chart response

m = calibrator Qstd slope

b = calibrator Qstd intercept

Ta = actual temperature during calibration (deg K)

Pa = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

$$1/m(I[\text{Sqrt}(298/Tav)(Pav/760)]-b)$$

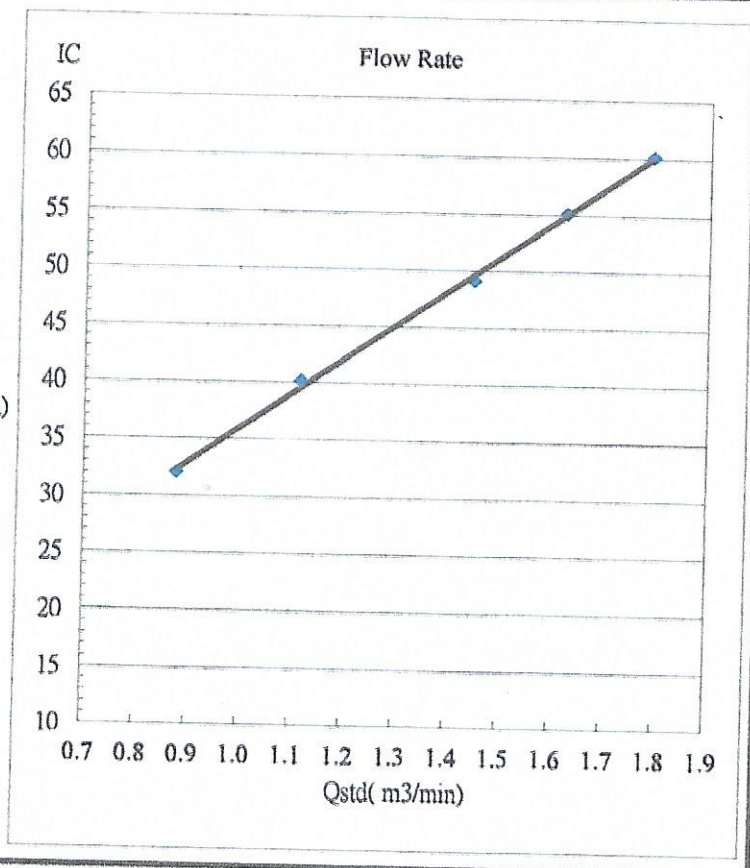
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure





Certificate of Calibration

Calibration Certification Information			
Cal. Date: December 15, 2023	Rootsmeter S/N: 438320	Ta: 295	°K
Operator: Jim Tisch		Pa: 748.5	mm Hg
Calibration Model #: TE-5025A	Calibrator S/N: 2454		

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4250	3.2	2.00
2	3	4	1	1.0090	6.4	4.00
3	5	6	1	0.9040	7.9	5.00
4	7	8	1	0.8610	8.8	5.50
5	9	10	1	0.7110	12.8	8.00

Data Tabulation					
Vstd (m3)	Qstd (x-axis)	$\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)}$ (y-axis)	Va	Qa (x-axis)	$\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)}$ (y-axis)
0.9907	0.6952	1.4106	0.9957	0.6988	0.8878
0.9864	0.9776	1.9949	0.9914	0.9826	1.2556
0.9844	1.0890	2.2304	0.9894	1.0945	1.4037
0.9832	1.1420	2.3393	0.9882	1.1478	1.4723
0.9779	1.3754	2.8213	0.9829	1.3824	1.7756
QSTD	m=	2.07544	QA	m=	1.29961
	b=	-0.03205		b=	-0.02017
	r=	0.99999		r=	0.99999

Calculations	
Vstd= $\Delta Vol \left(\frac{Pa - \Delta P}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)$	Va= $\Delta Vol \left(\frac{Pa - \Delta P}{Pa} \right)$
Qstd= Vstd/ΔTime	Qa= Va/ΔTime
For subsequent flow rate calculations:	
Qstd= $1/m \left(\left(\sqrt{\Delta H \left(\frac{Pa}{Pstd} \right) \left(\frac{Tstd}{Ta} \right)} \right) - b \right)$	Qa= $1/m \left(\left(\sqrt{\Delta H \left(\frac{Ta}{Pa} \right)} \right) - b \right)$

Standard Conditions	
Tstd:	298.15 °K
Pstd:	760 mm Hg
Key	
ΔH:	calibrator manometer reading (in H2O)
ΔP:	rootsmeter manometer reading (mm Hg)
Ta:	actual absolute temperature (°K)
Pa:	actual barometric 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



ANNEX E2

MONITORING SCHEDULE FOR AIR
QUALITY

Tung Chung New Town Extension (East)
Air Quality Monitoring Schedule (December 2024)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec
	Air Quality Monitoring					Air Quality Monitoring
8-Dec	9-Dec	10-Dec	11-Dec	12-Dec	13-Dec	14-Dec
					Air Quality Monitoring	
15-Dec	16-Dec	17-Dec	18-Dec	19-Dec	20-Dec	21-Dec
				Air Quality Monitoring		
22-Dec	23-Dec	24-Dec	25-Dec	26-Dec	27-Dec	28-Dec
		Air Quality Monitoring				
29-Dec	30-Dec	31-Dec				
	Air Quality Monitoring					



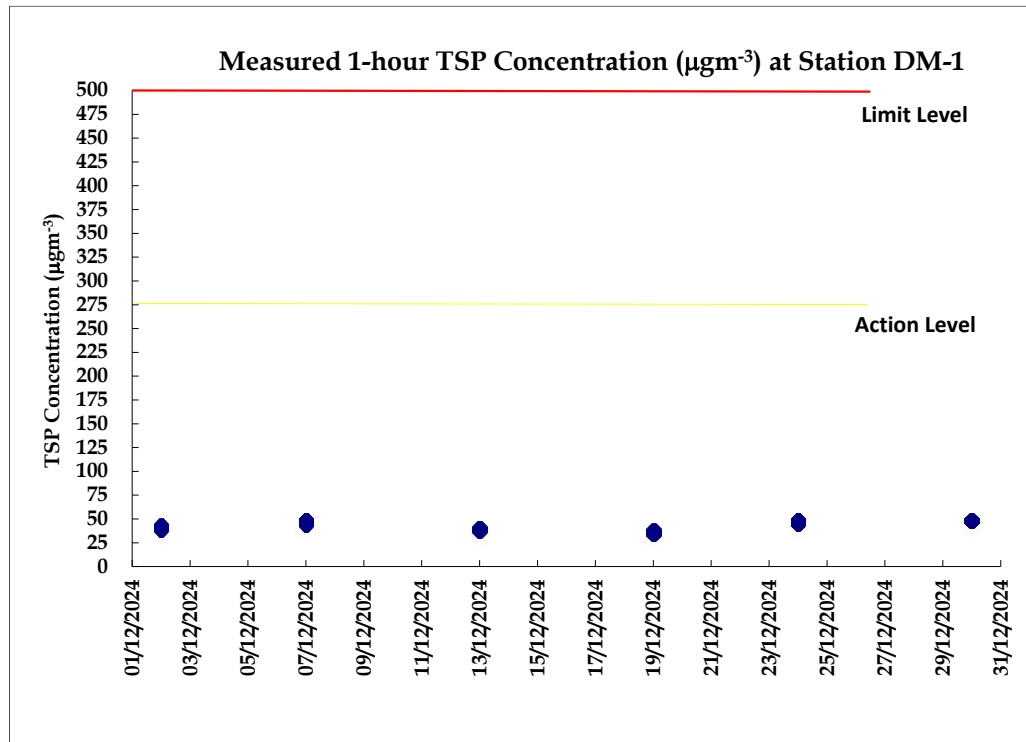
ANNEX E3

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 ($\mu\text{g}/\text{m}^3$)
12/2/2024	9:02	10:02	Sunny	42
12/2/2024	10:02	11:02	Sunny	43
12/2/2024	11:02	12:02	Sunny	39
12/7/2024	13:02	14:02	Sunny	45
12/7/2024	14:02	15:02	Sunny	44
12/7/2024	15:02	16:02	Sunny	49
12/13/2024	9:05	10:05	Sunny	40
12/13/2024	10:05	11:05	Sunny	40
12/13/2024	11:05	12:05	Sunny	38
12/19/2024	9:08	10:08	Sunny	38
12/19/2024	10:08	11:08	Sunny	37
12/19/2024	11:08	12:08	Sunny	34
12/24/2024	13:45	14:45	Cloudy	47
12/24/2024	14:45	15:45	Cloudy	49
12/24/2024	15:45	16:45	Cloudy	45
12/30/2024	9:02	10:02	Sunny	48
12/30/2024	10:02	11:02	Sunny	49
12/30/2024	11:02	12:02	Sunny	48

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





ANNEX E4

EVENT AND ACTION PLAN FOR AIR
QUALITY

Annex E4 Event and Action Plan for Air Quality

Event	Action			
	ET	IEC	ER	Contractor
Action level exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method. 	<ol style="list-style-type: none"> 1. Notify Contractor. 	<ol style="list-style-type: none"> 1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
Action level exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ET on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

Event	Action			
	ET	IEC	ER	Contractor
Limit level exceedance for one sample	<ol style="list-style-type: none"> 1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results. 	<ol style="list-style-type: none"> 1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.
Limit level exceedance for two or more consecutive samples	<ol style="list-style-type: none"> 1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring. 	<ol style="list-style-type: none"> 1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. 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. 	<ol style="list-style-type: none"> 1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as determined by the ER until the exceedance is abated.