JOB NO.: TCS00694/13

AGREEMENT NO. CE 45/2008 (CE)
LIANTANG/HEUNG YUEN WAI
BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

MONTHLY ENVIRONMENTAL MONITORING AND AUDIT REPORT (NO.54) – JANUARY 2018

PREPARED FOR
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT (CEDD)

Date	Reference No.	Prepared By	Certified By
12 February 2018	TCS00694/13/600/R1448v2		
		Nicola Hon (Environmental Consultant)	Tam Tak Wing (Environmental Team Leader)

Version	Date	Remarks
1	8 February 2018	First Submission
2	12 February 2018	Amended according to the IEC's comments on 8 February 2018

SMEC

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14 February 2018

AECOM
8/F, Grand Central Plaza, Tower 2
138 Shatin Rural Committee Road
Shatin, N.T.

By Email & Post

Attention: Mr Simon LEUNG

Dear Sir

Agreement No. CE 45/2008 (CE)
Liantang/Heung Yuen Wai Boundary Control Point and Associated Works
Independent Environmental Checker – Investigation
Monthly EM&A Report (No. 54) – January 2018

With reference to the Monthly EM&A Report No. 54 for January 2018 (Version 2) certified by the ET Leader, please be noted that we have no adverse comments on the captioned submission. We herewith verify the captioned submission in accordance with Condition 5.4 of the Environmental Permit No. EP-404/2011/D.

Thank you for your attention and please do not hesitate to contact the undersigned on tel. 3995-8120 or by email to antony.wong@smec.com; or our Mr Arthur CHIU on tel. 3995-8144 or by email to arthur.chiu@smec.com.

Yours faithfully

Antony WONG
Independent Environmental Checker

cc	CEDD/BCP	-	Mr LU Pei Yu / Mr William CHEUNG	by fax: 3547 1659
	ArchSD	-	Mr William WL CHENG	by fax: 2804 6805
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	Ronald Lu	-	Mr Peter YAM / Mr Justin CHEUNG	by email
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EXECUTIVE SUMMARY

ES01 This is the **54th** monthly EM&A report presenting the monitoring results and inspection findings for the reporting period from **1 to 31 January 2018** (hereinafter 'the Reporting Period').

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

ES02 To facilitate the project management and implementation, Liantang/Heung Yuen Wai Boundary Control Point and Associated Works of the Project is divided to seven CEDD contracts including Contract 2 (CV/2012/08), Contract 3 (CV/2012/09), Contract 4 (NE/2014/02), Contract 5 (CV/2013/03), Contract 6 (CV/2013/08) and Contract 7 (NE/2014/03) and an ArshSD contract (Contract SS C505).

ES03 In the Reporting Period, the major construction works under Liantang/Heung Yuen Wai Boundary Control Point and Associated Works of the Project included Contract 2, Contract 3, Contract 4, Contract 6, Contract 7 and Contract SS C505. Environmental monitoring activities under the EM&A programme in the Reporting Period are summarized in the following table.

Environmental Aspect	Environmental Monitoring Parameters / Inspection	Reporting Period	
		Number of Monitoring Locations to undertake	Total Occasions
Air Quality	1-hour TSP	9	147
	24-hour TSP	9	54
Construction Noise	$L_{eq(30min)}$ Daytime	10	45
Water Quality	Water in-situ measurement and/or sampling	WM1 & WM1-C	14 Scheduled & 0 extra
		WM2A(a) & WM2A-Cx	14 Scheduled & 4 extra
		WM2B & WM2B-C	14 Scheduled & 0 extra (*)
		WM3x &WM3-C	14 Scheduled & 2 extra
		WM4, WM4-CA &WM4-CB	14 Scheduled & 0 extra
Ecology	Woodland compensation i) General Health condition of planted species ii) Survival of planted species	9 Quadrats and transect	0
Joint Site Inspection / Audit	IEC, ET, the Contractor and RE joint site Environmental Inspection and Auditing	Contract 2	4
		Contract 3	4
		Contract 4	4
		Contract 6	4
		Contract 7	4
		Contract SS C505 (#)	5

Remark:
(#) IEC only joined one (1) event of site inspection for Contract SS C505.
(*) In the whole Reporting Period, water sampling was unable to carry out at WM2B and WM2B-C due to shallow water (water depth under 150mm)

ACTION AND LIMIT (A/L) LEVELS EXCEEDANCE

ES04 In the Reporting Period, no air quality and construction noise exceedance and valid noise complaint was recorded. For water quality monitoring, a total of sixteen (16) Action/ Limit Level exceedances were recorded under the Project. The summary of exceedance in the Reporting Period is shown below.

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action			
				NOE Issued	Investigation Result	Project related exceedance	Corrective Actions
Air Quality	1-hour TSP	0	0	0	--	--	--
	24-hour TSP	0	0	0	--	--	--

Environmental Aspect	Monitoring Parameters	Action Level	Limit Level	Event & Action			
				NOE Issued	Investigation Result	Project related exceedance	Corrective Actions
Construction Noise	$L_{eq(30min)}$ Daytime	0	0	0	--	--	--
Water Quality	DO	0	0	0	-	--	--
	Turbidity	**1**	**7**	**8**	- All exceedances were not project related.	0	The Contractor should fully implement water quality mitigation measure.
	SS	0	**8**	**8**		0	

ES05 Investigation Reports for all water quality exceedances were completed by ET. Investigation results revealed that the Contractor had properly implemented water quality mitigation measures such as covering the expose area with tarpaulin sheet and provided bunds align the watercourse. It was concluded that the exceedances recorded at WM2A(a) on 8 to 13 January 2018 and WM3x on 8 January 2018 were completed were related to the impact of rainstorm and not caused by the works under the Project. For exceedances recorded atWM3x on 27 January 2018, it was concluded that the exceedances were related to the external source of turbid water and not project related.

ENVIRONMENTAL COMPLAINT

ES06 In this Reporting Period, one (1) documented environmental complaint was received regarding the waste management under the EM&A Programme. Investigation for the complaint is underway and site inspection at complaint location is arranged on 9 February 2018 for investigation.

NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES07 No environmental summons and prosecutions were recorded in the Reporting Period.

REPORTING CHANGE

ES08 No reporting changes were made in the Reporting Period.

SITE INSPECTION

ES09 In this Reporting Period, joint site inspection to evaluate the site environmental performance at ***Contract 2*** has been carried out by the RE, IEC, ET and the Contractor on **5, 12, 19 and 25 January 2018**. No non-compliance was noted during the site inspection.

ES10 In the Reporting Period, joint site inspection to evaluate the site environmental performance at ***Contract 3*** has been carried out by the RE, IEC, ET and the Contractor on **4, 11, 17 and 25 January 2018**. No non-compliance was noted during the site inspection.

ES11 In the Reporting Period, joint site inspection to evaluate the site environmental performance at **Contract 4** has been carried out by the RE, IEC, ET and the Contractor on **5, 12, 15 and 26 January 2018**. No non-compliance was noted.

ES12 In the Reporting Period, joint site inspection to evaluate the site environmental performance at ***Contract 6*** has been carried out by the RE, IEC, ET and the Contractor on **4, 11, 18 and 26 January 2018**. No non-compliance was noted during the site inspection.

ES13 In the Reporting Period, joint site inspection for **Contract 7** to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **5, 12, 16 and 26 January 2018**. No non-compliance was noted during the site inspection.

ES14 In the Reporting Period, joint site inspection to evaluate the site environmental performance at ***Contract SS C505*** has been carried out by the RE, ET and the Contractor on **3, 10, 17, 24 and 31 January 2018** in which IEC joined the site inspection on **24 January 2018**. No non-compliance was noted during the site inspection.

FUTURE KEY ISSUES

ES15 During dry season, special attention should be paid on the potential construction dust impact since most of the construction sites are adjacent to villages. The Contractor should fully implement the construction dust mitigation measures as appropriately.

ES16 Preventive measures for muddy water or other water pollutants from site surface flow to local stream such as Kong Yiu Channel, Ma Wat Channel, Ping Yuen River, Kwan Tei River or public area should be properly maintained. The Contractors should paid special attention on water quality mitigation measures and fully implement according ISEMM of the EM&A Manual, in particular for working areas near Ma Wat Channel and Ping Yuen River.

ES17 In addition, all effluent discharge shall be ensure to fulfill Technical Memorandum of Effluent Discharged into Drainage and Sewerage Systems, inland and Coastal Waters criteria or discharge permits stipulation.

ES18 Construction noise would be a key environmental issue during construction work of the Project. Noise mitigation measures such as using quiet plants should be implemented in accordance with the EM&A requirement.

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1 INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 Civil Engineering and Development Department is the Project Proponent and the Permit Holder of *Agreement No. CE 45/2008 (CE) Liantang / Heung Yuen Wai Boundary Control Point and Associated Works*, which is a Designated Project to be implemented under Environmental Permit number EP-404/2011/D granted on 20 January 2017.

1.1.2 The Project consists of two main components: Construction of a Boundary Control Point (hereinafter referred as "BCP"); and Construction of a connecting road alignment. Layout plan of the Project is shown in ***Appendix A***.

1.1.3 The proposed BCP is located at the boundary with Shenzhen near the existing Chuk Yuen Village, comprising a main passenger building with passenger and cargo processing facilities and the associated customs, transport and ancillary facilities. The connecting road alignment consists of six main sections:

1) Lin Ma Hang to Frontier Closed Area (FCA) Boundary – this section comprises at-grade and viaducts and includes the improvement works at Lin Ma Hang Road;
2) Ping Yeung to Wo Keng Shan – this section stretches from the Frontier Closed Area Boundary to the tunnel portal at Cheung Shan and comprises at-grade and viaducts including an interchange at Ping Yeung;
3) North Tunnel – this section comprises the tunnel segment at Cheung Shan and includes a ventilation building at the portals on either end of the tunnel;
4) Sha Tau Kok Road – this section stretches from the tunnel portal at Wo Keng Shan to the tunnel portal south of Loi Tung and comprises at-grade and viaducts including an interchange at Sha Tau Kok and an administration building;
5) South Tunnel – this section comprises a tunnel segment that stretches from Loi Tung to Fanling and includes a ventilation building at the portals on either end of the tunnel as well as a ventilation building in the middle of the tunnel near Lau Shui Heung;
6) Fanling – this section comprises the at-grade, viaducts and interchange connection to the existing Fanling Highway.

1.1.4 Action-United Environmental Services & Consulting has been commissioned as an Independent ET to implement the relevant EM&A program in accordance with the approved EM&A Manual, as well as the associated duties. As part of the EM&A program, the baseline monitoring has carried out between **13 June 2013** and **12 July 2013** for all parameters including air quality, noise and water quality before construction work commencement. The Baseline Monitoring Report summarized the key findings and the rationale behind determining a set of Action and Limit Levels (A/L Levels) from the baseline data. Also, the Project baseline monitoring report which verified by the IEC has been submitted to EPD on **16 July 2013** for endorsement. The major construction works of the Project was commenced on **16 August 2013** in accordance with the EP Section 5.3 stipulation.

1.1.5 This is **54th** monthly EM&A report presenting the monitoring results and inspection findings for reporting period from **1** to **31 January 2018**.

1.2 REPORT STRUCTURE

1.2.1 The Monthly Environmental Monitoring and Audit (EM&A) Report is structured into the following sections:-

Section 1 *Introduction*
Section 2 *Project Organization and Construction Progress*
Section 3 *Summary of Impact Monitoring Requirements*
Section 4 *Air Quality Monitoring*
Section 5 *Construction Noise Monitoring*
Section 6 *Water Quality Monitoring*

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 CONSTRUCTION CONTRACT PACKAGING

2.1.1 To facilitate the project management and implementation, the Project would be divided by the following contracts:

- Contract 2 (CV/2012/08)
- Contract 3 (CV/2012/09)
- Contract 4 (NE/2014/02)
- Contract 5 (CV/2013/03)
- Contract 6 (CV/2013/08)
- Contract 7 (NE/2014/03)
- ArchSD Contract No. SS C505

2.1.2 The details of each contracts is summarized below and the delineation of each contracts is shown in ***Appendix A***.

Contract 2 (CV/2012/08)

2.1.3 Contract 2 has awarded in December 2013 and construction work was commenced on 19 May 2014. Major Scope of Work of the Contract 2 is listed below:

- construction of an approximately 5.2km long dual two-lane connecting road (with about 0.4km of at-grade road and 4.8km of tunnel) connecting the Fanling Interchange with the proposed Sha Tau Kok Interchange;
- construction of a ventilation adit tunnel and the mid-ventilation building;
- construction of the north and south portal buildings of the Lung Shan Tunnel and their associated slope works;
- provision and installation of ventilation system, E&M works and building services works for Lung Shan tunnel and Cheung Shan tunnel and their portal buildings;
- construction of Tunnel Administration Building adjacent to Wo Keng Shan Road and the associated E&M and building services works; and
- construction of associated footpath, slopes, retaining structures, drainage, sewerage, waterworks, landscaping works and other ancillary works.

Contract 3 (CV/2012/09)

2.1.4 Contract 3 was awarded in July 2013 and construction work was commenced on 5 November 2013. Major Scope of Work of the Contract 3 is listed below:

- construction of four link roads connecting the existing Fanling Highway and the south portal of the Lung Shan Tunnel;
- realignment of the existing Tai Wo Service Road West and Tai Wo Service Road East;
- widening of the existing Fanling Highway (HyD's entrustment works);
- demolishing existing Kiu Tau vehicular bridge and Kiu Tau footbridge and reconstruction of the existing Kiu Tau Footbridge (HyD's entrustment works); and
- construction of associated footpath, slopes, retaining structures, drainage, sewerage, waterworks, landscaping works and other ancillary works.

Contract 4 (NE/2014/02)

2.1.5 Contract 4 has awarded in mid-April 2016 and construction work was commenced on 2 May 2017. The scope of work of the Contract 4 includes:

- design, supply, delivery, installation, testing and commissioning of a traffic control and surveillance system for the connecting road linking up the Liantang / Heung Yuen Wai Boundary Control Point and the existing Fanling Highway.

Contract 5 (CV/2013/03)

2.1.6 Contract 5 has awarded in April 2013 and construction work was commenced in August 2013. Major Scope of Work of the Contract 5 is listed below:

- site formation of about 23 hectares of land for the development of the BCP;
- construction of an approximately 1.6 km long perimeter road at the BCP including a 175m long depressed road;
- associated diversion/modification works at existing local roads and junctions including Lin Ma Hang Road;
- construction of pedestrian subway linking the BCP to Lin Ma Hang Road;
- provision of resite area with supporting infrastructure for reprovisioning of the affected village houses; and
- construction of associated footpath, slopes, retaining structures, drainage, sewerage, waterworks, landscaping works and other ancillary works.

Contract 6 (CV/2013/08)

2.1.7 Contract 6 has awarded in June 2015 and construction work was commenced on 23 October 2015. Major Scope of Work of the Contract 6 would be included below:

- construction of an approximately 4.6km long dual two-lane connecting road (with about 0.6km of at-grade road, 3.3km of viaduct and 0.7km of tunnel) connecting the BCP with the proposed Sha Tau Kok Road Interchange and the associated ventilation buildings;
- associated diversion/modification works at access roads to the resite of Chuk Yuen Village;
- provision of sewage collection, treatment and disposal facilities for the BCP and the resite of Chuk Yuen Village;
- construction of a pedestrian subway linking the BCP to Lin Ma Hang Road;
- provisioning of the affected facilities including Wo Keng Shan Road garden; and
- construction of associated footpath, slopes, retaining structures, drainage, sewerage, waterworks, landscaping works and other ancillary works.

Contract 7 (NE/2014/03)

2.1.8 Contract 7 has awarded in December 2015 and the construction works of Contract 7 was commenced on 15 February 2016. Major Scope of Work of the Contract 7 would be included below:

- construction of the Hong Kong Special Administrative Region (HKSAR) portion of four vehicular bridge
- construction of one pedestrian bridge crossing Shenzhen (SZ) River (cross boundary bridges)

ArchSD Contract No. SS C505

2.1.9 SS C505 has awarded in July 2015 and construction work was commenced on 1 September 2015. Major Scope of Work of the SS C505 would be included below:

- passenger-related facilities including processing kiosks and examination facilities for private cars and coaches, passenger clearance building and halls, the interior fitting works for the pedestrian bridge crossing Shenzhen River, etc.;
- cargo processing facilities including kiosks for clearance of goods vehicles, customs inspection platforms, X-ray building, etc.;
- accommodation for the facilities inside of the Government departments providing services in connection with the BCP;
- transport-related facilities inside the BCP including road networks, public transport interchange, transport drop-off and pick-up areas, vehicle holding areas and associated road furniture etc;
- a public carpark; and

- other ancillary facilities such as sewerage and drainage, building services provisions and electronic systems, associated environmental mitigation measure and landscape works.

2.2 PROJECT ORGANIZATION

2.2.1 The project organization is shown in ***Appendix B***. The responsibilities of respective parties are:

Civil Engineering and Development Department (CEDD)

2.2.2 CEDD is the Project Proponent and the Permit Holder of the EP of the development of the Project and will assume overall responsibility for the project. An Independent Environmental Checker (IEC) shall be employed by CEDD to audit the results of the EM&A works carried out by the ET.

Architectural Services Department (ArchSD)

2.2.3 ArchSD acts as the works agent for Development Bureau (DEVB), for Contract SS C505 Liantang/ Heung Yuen Wai Boundary Control Point (BCP) – BCP Buildings and Associated Facilities.

Environmental Protection Department (EPD)

2.2.4 EPD is the statutory enforcement body for environmental protection matters in Hong Kong.

Ronald Lu & Partners (Hong Kong) Ltd (The Architect)

2.2.5 Ronald Lu & Partners (Hong Kong) Ltd is appointed by ArchSD as an Architect for Contract SS C505 Liantang/ Heung Yuen Wai Boundary Control Point (BCP) – BCP Buildings and Associated Facilities. It responsible for overseeing the construction works of Contract SS C505 and for ensuring that the works are undertaken by the Contractor in accordance with the specification and contract requirements. The duties and responsibilities of the Architect with respect to EM&A are:

- Monitor the Contractors' compliance with contract specifications, including the implementation and operation of the environmental mitigation measures and their effectiveness
- Monitor Contractors' and ET's compliance with the requirements in the Environmental Permit (EP) and EM&A Manual
- Facilitate ET's implementation of the EM&A programme
- Participate in joint site inspection by the ET and IEC
- Oversee the implementation of the agreed Event / Action Plan in the event of any exceedance
- Adhere to the procedures for carrying out complaint investigation
- Liaison with DSD, Engineer/Engineer's Representative, ET, IEC and the Contractor of the "Construction of the DSD's Regulation of Shenzhen River Stage 4 (RSR 4)" Project discussing regarding the cumulative impact issues.

Engineer or Engineers Representative (ER)

2.2.6 The ER is responsible for overseeing the construction works and for ensuring that the works are undertaken by the Contractor in accordance with the specification and contract requirements. The duties and responsibilities of the ER with respect to EM&A are:

- Monitor the Contractors' compliance with contract specifications, including the implementation and operation of the environmental mitigation measures and their effectiveness
- Monitor Contractors's, ET's and IEC's compliance with the requirements in the Environmental Permit (EP) and EM&A Manual
- Facilitate ET's implementation of the EM&A programme
- Participate in joint site inspection by the ET and IEC
- Oversee the implementation of the agreed Event / Action Plan in the event of any exceedance

- Adhere to the procedures for carrying out complaint investigation
- Liaison with DSD, Engineer/Engineer's Representative, ET, IEC and the Contractor of the "Construction of the DSD's Regulaiton of Shenzhen River Stage 4 (RSR 4)" Project discussing regarding the cumulative impact issues.

The Contractor(s)

2.2.7 There will be one contractor for each individual works contract. Once the contractors are appointed, EPD, ET and IEC will be notified the details of the contractor.

2.2.8 The Contractor for Contracts under CEDD should report to the ER. For ArchSD Contract, the Contractor should report to the Architect or Architect's Representative (AR). The duties and responsibilities of the Contractor are:

- Comply with the relevant contract conditions and specifications on environmental protection
- Employ an Environmental Team (ET) to undertake monitoring, laboratory analysis and reporting of EM &A Facilitate ET's monitoring and site inspection activities
- Participate in the site inspections by the ET and IEC, and undertake any corrective actions
- Provide information / advice to the ET regarding works programme and activities which may contribute to the generation of adverse environmental impacts
- Submit proposals on mitigation measures in case of exceedances of Action and Limit levels in accordance with the Event / Action Plans
- Implement measures to reduce impact where Action and Limit levels are exceeded
- Adhere to the procedures for carrying out complaint investigation

Environmental Team (ET)

2.2.9 Once the ET is appointed, the EPD, CEDD, ER, Architect and IEC will be notified the details of the ET.

2.2.10 The ET shall not be in any way an associated body of the Contractor(s), and shall be employed by the Project Proponent/Contractor to conduct the EM&A programme. The ET should be managed by the ET Leader. The ET Leader shall be a person who has at least 7 years' experience in EM&A and has relevant professional qualifications. Suitably qualified staff should be included in the ET, and resources for the implementation of the EM&A programme should be allocated in time under the Contract(s), to enable fulfillment of the Project's EM&A requirements as specified in the EM&A Manual during construction of the Project. The ET shall report to the Project Proponent and the duties shall include:

- Monitor and audit various environmental parameters as required in this EM&A Manual
- Analyse the environmental monitoring and audit data, review the success of EM&A programme and the adequacy of mitigation measures implemented, confirm the validity of the EIA predictions and identify any adverse environmental impacts arising
- Carry out regular site inspection to investigate and audit the Contractors' site practice, equipment/plant and work methodologies with respect to pollution control and environmental mitigation, and effect proactive action to pre-empt problems
- Monitor compliance with conditions in the EP, environmental protection, pollution prevention and control regulations and contract specifications
- Audit environmental conditions on site
- Report on the environmental monitoring and audit results to EPD, the ER, the Architect, the lEC and Contractor or their delegated representatives
- Recommend suitable mitigation measures to the Contractor in the case of exceedance of Action and Limit levels in accordance with the Event and Action Plans
- Liaise with the IEC on all environmental performance matters and timely submit all relevant EM&A proforma for approval by IEC
- Advise the Contractor(s) on environmental improvement, awareness, enhancement measures etc., on site
- Adhere to the procedures for carrying out complaint investigation

- Liaison with the client departments, Engineer/Engineer's Representative, ET, lEC and the Contractor(s) of the concurrent projects as listed under Section 2.3 below regarding the cumulative impact issues.

Independent Environmental Checker (IEC)

2.2.11 One IEC will be employed for this Project. Once the IEC is appointed, EPD, ER, the Architect and ET will be notified the details of the IEC.

2.2.12 The Independent Environmental Checker (IEC) should not be in any way an associated body of the Contractor or the ET for the Project. The IEC should be employed by the Permit Holder (i.e., CEDD) prior to the commencement of the construction of the Project. The IEC should have at least 10 years' experience in EM&A and have relevant professional qualifications. The appointment of IEC should be subject to the approval of EPD. The IEC should:

- Provide proactive advice to the ER and the Project Proponent on EM&A matters related to the project, independent from the management of construction works, but empowered to audit the environmental performance of construction
- Review and audit all aspects of the EM&A programme implemented by the ET
- Review and verify the monitoring data and all submissions in connection with the EP and EM&A Manual submitted by the ET
- Arrange and conduct regular, at least monthly site inspections of the works during construction phase, and ad hoc inspections if significant environmental problems are identified
- Check compliance with the agreed Event / Action Plan in the event of any exceedance
- Check compliance with the procedures for carrying out complaint investigation
- Check the effectiveness of corrective measures
- Feedback audit results to ET by signing off relevant EM&A proforma
- Check that the mitigation measures are effectively implemented
- Verify the log-book(s) mentioned in Condition 2.2 of the EP, notify the Director by fax, within one working day of receipt of notification from the ET Leader of each and every occurrence, change of circumstances or non-compliance with the EIA Report and/or the EP, which might affect the monitoring or control of adverse environmental impacts from the Project
- Report the works conducted, the findings, recommendation and improvement of the site inspections, after reviewing ET's and Contractor's works, and advices to the ER and Project Proponent on a monthly basis
- Liaison with the client departments, Engineer/Engineer's Representative, the Architect, ET, lEC and the Contractor of the concurrent projects as listed under Section 2.3 below regarding the cumulative impact issues.

2.3 CONCURRENT PROJECTS

2.3.1 The concurrent construction works that may be carried out include, but not limited to, the following:

(a) Regulation of Shenzhen River Stage IV;

(b) Widening of Fanling Highway – Tai Hang to Wo Hop Shek Interchange – Contract No. HY/2012/06;

(c) Construction of BCP facilities in Shenzhen.

2.4 CONSTRUCTION PROGRESS

2.4.1 In the Reporting Period, the major construction activity conducted under the Project is located in Contracts 2, 3, 6, 7 and SS C505 and they are summarized in below. Moreover, 3-month rolling construction program for all the current contracts is enclosed in ***Appendix C***.

Contract 2 (CV/2012/08)

2.4.2 The contract commenced in May 2014. In this Reporting Period, construction activities conducted are listed below:

Mid-Vent Portal	• Cavern internal structure and tunnel E&M activities • Stud tunnel post-excavation and earthworks • Structure connecting adit and ventilation building • Ventilation building superstructure and backfilling • Ventilation building fitting out and E&M installation
North Portal	• Southbound and Northbound tunnel waterproofing and lining • Construction of cross passage and internal structure • Tunnel backfilling • Tunnel Boring Machine (TBM) North drive excavation and mucking out • Tunnel E&M installation • North ventilation building structure • Construction of retaining wall • Site formation and construction of slip road • Drainage cleansing works
South Portal	• Post-excavation tunnel activities • Tunnel backfilling, waterproofing, lining, internal structure and cross passage • Construction of retaining wall and backfilling activities • South ventilation building external wall finishing, fitting out and E&M installations
Admin Building	• Construction of fence wall and permanent drainage • Admin building fitting out, underground utilities and E&M installation

Contract 3 (CV/2012/09)

2.4.3 The Contract commenced in November 2013. In this Reporting Period, construction activities conducted are listed below:

- Boundary wall for pumping station
- Cable Detection and Trial Trenches
- Installation of Noise Barrier Steel Column & Panel
- Remaining Works on New Kiu Tau Footbridge
- Mini-pile Installation
- Noise Barrier Construction
- Roadworks
- Viaduct Segment Erection
- Water Main Laying Works
- Parapet Installation on Bridge Deck
- Construction of Profile Barrier & Planter Wall on Bridge Deck
- Drainage Work
- Stressing of External Tendon
- Construction of Retaining Wall Behind Abutment
- Waterproofing works on Bridge deck
- Stitching works for longitudinal stitch of viaduct
- Installation of BFA lift
- Installation of Sign Gantry

Contract 4 (NE/2014/02)

2.4.4 The Contract was awarded in mid-April 2016 and the construction work was commenced on 2 May 2017. In this Reporting Period, construction activities conducted are listed below:

- System design and testing

- E&M installation at Admin Building
- E&M installation at Ventilation Building

Contract 5 (CV/2013/03)

2.4.5 The construction works under Contract 5 was substantially completed on 31 August 2016.

Contract 6 (CV/2013/08)

2.4.6 Contract 6 has awarded in June 2015 and construction work was commenced on 23 October 2015. In this Reporting Period, construction activities conducted are listed below:

- Segment Erection
- Bridge Installation
- Tunneling Works
- Sewage Treatment Plant Construction
- Tunnel Ventilation Building Construction
- Slip Road/At-grade Road/Periphery Road Construction

Contract 7 (NE/2014/03)

2.4.7 Contract 7 has awarded in December 2015 and construction work was commenced on 15 February 2016. In this Reporting Period, construction activities conducted are listed below:

- Column and deck construction at Bridges A and E
- Falsework and formwork removal at Bridges B and D
- Installation of Façade at Bridge C
- Staircase construction at Bridge C
- R/F Slab construction at Bridge C

Contract SS C505

2.4.8 Contract SS C505 has awarded in July 2015 and construction work was commenced on 1 September 2015. In this Reporting Period, construction activities conducted are listed below:

- Building no. 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 13, 18, 41 and 43 constructions
- Tower crane operation
- Bridge construction works including construction of bridge column, retaining wall, pile cap, pier, abutment, road and finishes works
- Underground drainage works, Road Works, CLP Cable laying and Landscaping
- Formwork and falsework for PTB's slab construction and Bridges Decks
- Construction PTB M/F, 1/F, 2/F and Roof flat slab
- Construction PTB non-structural wall, Late Cast Strip, Stairs and Lift Shaft
- PTB backfilling works
- Integrated ABWF & MEP Works in PTB, Building no. 1, 2, 3, 4, 5, 6, 7, 10 and 18
- Elevated Walkway E1, E2, E3 and E4 construction
- Bridge deck construction for Bridges 1 - 5

2.5 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.5.1 In according to the EP, the required documents have submitted to EPD which listed in below:

- Project Layout Plans of Contracts 2, 3, 4, 5, 6, 7 and SS C505
- Landscape Plan
- Topsoil Management Plan
- Environmental Monitoring and Audit Programme
- Baseline Monitoring Report (TCS00690/13/600/R0030v3) for the Project
- Waste Management Plan of the Contracts 2, 3, 4, 5, 6, 7 and SS C505
- Contamination Assessment Plan (CAP) and Contamination Assessment Report (CAR) for Po Kat Tsai, Loi Tung and the workshops in Fanling
- Vegetation Survey Report
- Woodland Compensation Plan
- Habitat Creation Management Plan

- Wetland Compensation Plan

2.5.2 Summary of the relevant permits, licenses, and/or notifications on environmental protection for the Project of each contracts are presented in ***Table 2-1***.

Table 2-1 Status of Environmental Licenses and Permits of the Contracts

Item	Description	License/Permit Status			
		Ref. no.		Effective Date	Expiry Date
Contract 2					
1	Air pollution Control (Construction Dust) Regulation	Ref No.: 368864		31 Dec 2013	Till Contract ends
2	Chemical Waste Producer Registration	***North Portal*** Waste Producers Number: No.5213-652-D2523-01		25 Mar 2014	Till Contract ends
		Mid-Vent Portal Waste Producers Number: No.5213-634-D2524-01		25 Mar 2014	Till Contract ends
		South Portal Waste Producers Number: No.5213-634-D2526-01		9 Apr 2014	Till Contract ends
3	Water Pollution Control Ordinance - Discharge License	No.WT00018374-2014		8 Oct 2014	30 Sep 2019
		No.: W5/1I389		28 Mar 2014	31 Mar 2019
		No. WT00023063-2015		18 Dec 2015	31 Mar 2019
		No.: W5/1I392		28 Mar 2014	31 Mar 2019
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7019105		8 Jan 2014	Till Contract ends
5	Construction Noise Permit	GW-RN0744-17	North Portal	15-Nov-2017	09-May-2018
		GW-RN0747-17		15-Nov-2017	09-May-2018
		GW-RN0839-17		25-Dec-2017	17-Jun-2018
		GW-RN0515-17	Mid Vent	10-Aug-2017	01-Feb-2018
		GW-RN0519-17		10-Aug-2017	01-Feb-2018
		GW-RN0765-17	South Portal	01-Dec-2017	31-May-2018
		GW-RN0601-17		27-Sep-2017	21-Mar-2018
		GW-RN0673-17		28-Oct-2017	27-Apr-2018
		GW-RN0788-17		06-Dec-2017	05-Jun-2018
		GW-RN0604-17	Admin Bldg	20-Sep-2017	16-Mar-2018
6	Specified Process License **(**Mortar Plant Operation)	L-3-251(1)		12 Apr 2016	11 Apr 2021
Contract 3					
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 362101		17 Jul 2013	Till Contract ends

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
2	Chemical Waste Producer Registration	Waste Producers Number: No.:5113-634-C3817-01	7 Oct 2013	Till Contract ends
3	Water Pollution Control Ordinance - Discharge License	No.:WT00016832 – 2013	28 Aug 13	31 Aug 2018
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7017914	2 Aug 13	Till Contract ends
5	Construction Noise Permit	GW-RN0477-17	28 Jul 2017	5 Jan 2018
		GW-RN0500-17	29 Aug 2017	24 Feb 2018
		GW-RN0501-17	25 Aug 2017	24 Feb 2018
		GW-RN0508-17	16 Aug 2017	15 Feb 2018
		GW-RN0549-17	6 Sep 2017	5 Mar 2018
		GW-RN0564-17	1 Oct 2017	31 Mar 2018
		GW-RN0567-17	10 Sep 2017	21 Feb 2018
		GW-RN0571-17	30 Sep 2017	29 Mar 2018
		GW-RN0669-17	25 Oct 2017	7 Apr 2018
		GW-RN0697-17	21 Nov 2017	19 May 2018
		GW-RN0721-17	26 Nov 2017	20 May 2018
		GW-RN0782-17	8 Dec 2017	26 May 2018
		GW-RN0785-17	19 Dec 2017	16 Jun 2018
		GW-RN0786-17	19 Dec 2017	18 Jun 2018
		GW-RN0801-17	22 Dec 2017	21 Jun 2018
		GW-RN0863-17	17 Jan 2018	5 Jul 2018
Contract 5				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 359338	13 May 2013	Till the end of Contract
2	Chemical Waste Producer Registration	Waste Producers Number No.: 5213-642-S3735-01	8 Jun 2013	Till the end of Contract
3	Water Pollution Control Ordinance - Discharge License	No.: W5/1G44/1	8 Jun 13	30 Jun 2018
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7017351	29 Apr 13	Till the end of Contract
Contract 6				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 390614	29 Jun 2015	Till the end of Contract

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
2	Chemical Waste Producer Registration	Waste Producers Number No.: 5213-652-C3969-01	31 Aug 2015	Till the end of Contract
3	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7022707	9 Jul 2015	Till the end of Contract
4	Water Pollution Control Ordinance - Discharge License	No.:WT00024574-2016	31 May 2016	31 May 2021
		No.:WT00024576-2016	31 May 2016	31 May 2021
		No.:WT00024742-2016	14 June 2016	30 June 2021
		No.:WT00024746-2016	14 June 2016	30 June 2021
5	Construction Noise Permit	GW-RW0598-17	18 Sep 2017	17 Mar 2018
		GW-RW0684-17	30 Oct 2017	29 Apr 2018
		GW-RN0837-17	25 Dec 2017	28 Feb 2018
		GW-RW0668-17	16-Jan-2018	15-Jul-2018
Contract SS C505				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 390974	13 Jul 2015	Till the end of Contract
2	Chemical Waste Producer Registration	Waste Producer No.: 5213-642-L1048-07	16 Sep 2015	Till the end of Contract
3	Water Pollution Control Ordinance - Discharge License	No.: WT00024865-2016	8 Jul 2016	30 Nov 2020
4	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7022831	23 Jul 2015	Till the end of Contract
5	Construction Noise Permit	GW-RN0624-17	6 Oct 2017	5 Apr 2018
		GW-RN0720-17	26 Nov 2017	25 May 2018
Contract 7				
1	Air pollution Control (Construction Dust) Regulation	Ref. No: 397015	21 Dec 2015	Till the end of Contract
2	Chemical Waste Producer Registration	Waste Producer No.: 5214-641-K3202-01	24 Mar 2016	Till the end of Contract
3	Water Pollution Control Ordinance - Discharge License	No.: WT00024422-2016	10 May 2016	31 May 2021
4	Waste Disposal Regulation - Billing Account for	Account No. 7024129	21 Jan 2016	Till the end of Contract

Item	Description	License/Permit Status		
		Ref. no.	Effective Date	Expiry Date
	Disposal of Construction Waste			
5	Construction Noise Permit	GW-RN0705-17	5 Nov 2017	4 May 2018
Contract 4				
1	Air pollution Control (Construction Dust) Regulation	Ref. No. 405353	22 July 2016	Till the end of Contract
2	Waste Disposal Regulation - Billing Account for Disposal of Construction Waste	Account No. 7024973	13 May 2016	Till the end of Contract

3 SUMMARY OF IMPACT MONITORING REQUIREMENTS

3.1 GENERAL

3.1.1 The Environmental Monitoring and Audit requirements are set out in the Approved EM&A manual. Environmental issues such as air quality, construction noise and water quality were identified as the key issues during the construction phase of the Project.

3.1.2 A summary of construction phase EM&A requirements are presented in the sub-sections below.

3.2 MONITORING PARAMETERS

3.2.1 The EM&A program of construction phase monitoring shall cover the following environmental issues:

- Air quality;
- Construction noise; and
- Water quality

3.2.2 A summary of the monitoring parameters is presented in ***Table 3-1.***

Table 3-1 Summary of EM&A Requirements

Environmental Issue	Parameters
Air Quality	• 1-hour TSP by Real-Time Portable Dust Meter; and • 24-hour TSP by High Volume Air Sampler.
Noise	• $L_{eq(30min)}$ in normal working days (Monday to Saturday) 07:00-19:00 except public holiday; and • 3 sets of consecutive $L_{eq(5min)}$ on restricted hours i.e. 19:00 to 07:00 next day, and whole day of public holiday or Sunday • Supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference.
Water Quality	**In-situ Measurements** • Dissolved Oxygen Concentration (mg/L); • Dissolved Oxygen Saturation (%); • Turbidity (NTU); • pH unit; • Water depth (m); and • Temperature (℃).
	Laboratory Analysis • Suspended Solids (mg/L)

3.3 MONITORING LOCATIONS

3.3.1 The designated monitoring locations as recommended in the *EM&A Manual* are shown in ***Appendix D***. As the access to some of the designated monitoring locations was questionable due to safety reason or denied by the landlords, alternative locations therefore have had proposed. The latest alternative monitoring locations has been updated in the revised EM&A Programme (Rev.7) which approved by EPD on 7 April 2017. ***Table 3-2***, ***Table 3-3*** and ***Table 3-4*** are respectively listed the air quality, construction noise and water quality monitoring locations for the Project and a map showing these monitoring stations is presented in ***Appendix E***.

Table 3-2 Impact Monitoring Stations - Air Quality

Station ID	Description	Works Area	Related to the Work Contract
AM1b^	Open area at Tsung Yuen Ha Village	BCP	SS C505 Contract 7
AM2	Village House near Lin Ma Hang Road	LMH to Frontier Closed Area	Contract 6
AM3	Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village.	LMH to Frontier Closed Area	Contract 6

Station ID	Description	Works Area	Related to the Work Contract
AM4b^	House no. 10B1 Nga Yiu Ha Village	LMH to Frontier Closed Area	Contract 6
AM5a^	Ping Yeung Village House	Ping Yeung to Wo Keng Shan	Contract 6
AM6	Wo Keng Shan Village House	Ping Yeung to Wo Keng Shan	Contract 6
AM7b@	Loi Tung Village House	Sha Tau Kok Road	Contract 2 Contract 6
AM8	Po Kat Tsai Village No. 4	Po Kat Tsai	Contract 2
AM9b#	Nam Wa Po Village House No. 80	Fanling	Contract 3

 # Proposal for the change of air quality monitoring location from AM9a to AM9b was submitted to EPD on 4 Nov 2013 after verified by the IEC and it was approved by EPD (EPD's ref.: (15) in EP 2/N7/A/52 Pt.10 dated 8 Nov 2013).
** Proposal for the change of air quality monitoring location from AM1to AM1a was submitted to EPD on 24 March 2014 after verified by the IEC. It was approved by EPD (EPD's ref.: (6) in EP 2/N7/A/52 Pt.12 dated 9 Jun 2014).*
@ Proposal for the change of air quality monitoring location from AM7a to AM7b was submitted to EPD on 4 June 2014 after verified by the IEC. It was approved by EPD (EPD's ref.: (7) in EP 2/N7/A/52 Pt.12 dated 9 Jun 2014).
^ Proposal for change of air quality monitoring locations was enclosed in the updated EM&A Programme which approval by EPD on 29 Mar 2016.

Table 3-3 Impact Monitoring Stations - Construction Noise

Station ID	Description	Works Area	Related to the Work Contract
NM1	Tsung Yuen Ha Village House No. 63	BCP	SS C505 Contract 7
NM2a#	Village House near Lin Ma Hang Road	Lin Ma Hang to Frontier Closed Area	Contract 6
NM3	Ping Yeung Village House (facade facing northeast)	Ping Yeung to Wo Keng Shan	Contract 6
NM4	Wo Keng Shan Village House	Ping Yeung to Wo Keng Shan	Contract 6
NM5	Village House, Loi Tung	Sha Tau Kok Road	Contract 2, Contract 6
NM6	Tai Tong Wu Village House 2	Sha Tau Kok Road	Contract 2, Contract 6
NM7	Po Kat Tsai Village	Po Kat Tsai	Contract 2
NM8	Village House, Tong Hang	Fanling	Contract 2 Contract 3
NM9	Village House, Kiu Tau Village	Fanling	Contract 3
NM10	Nam Wa Po Village House No. 80	Fanling	Contract 3

 # Proposal for the change of construction noise monitoring location from NM2 to NM2a was verified by the IEC on 6 May 2016 and was effective on 9 May 2016.

Table 3-4 Impact Monitoring Stations - Water Quality

Station ID	Description	Coordinates of Designated / Alternative Location		Nature of the location	Related to the Work Contract
		Easting	Northing		
WM1	Downstream of Kong Yiu Channel	833 679	845 421	Alternative location located at upstream 51m of the designated location	SS C505 Contract 6
WM1-Control	Upstream of Kong Yiu Channel	834 185	845 917	NA	SS C505 Contract 6
WM2A	Downstream of River Ganges	834 204	844 471	Alternative location located at upstream 81m of the designated location	Contract 6
WM2A(a)*	Downstream of River Ganges	834 191	844 474	Alternative location located at upstream 70m of the designated location	Contract 6
WM2A-Controlx#	Upstream of River Ganges	835 377	844 188	Alternative location located at upstream 160m of the designated location	Contract 6
WM2B	Downstream of River Ganges	835 433	843 397	NA	Contract 6
WM2B-Control	Upstream of River Ganges	835 835	843 351	Alternative location located at downstream 31m of the designated location	Contract 6
WM3x#	Downstream of River Indus	836 206	842 270	Alternative location located at downstream 180m of the designated location	Contract 2 Contract 6
WM3-Control	Upstream of River Indus	836 763	842 400	Alternative location located at downstream 26m of the designated location	Contract 2 Contract 6
WM4	Downstream of Ma Wat Channel	833 850	838 338	Alternative location located at upstream 11m of the designated location	Contract 2 Contract 3
WM4–Control A	Kau Lung Hang Stream	834 028	837 695	Alternative location located at downstream 28m of the designated location	Contract 2 Contract 3
WM4–Control B	Upstream of Ma Wat Channel	833760	837395	Alternative location located at upstream 15m of the designated location	Contract 2 Contract 3

Note: EPD has approved the revised EM&A Programme (Rev.7) which proposed that (1) if the measured water depth of the monitoring station is lower than 150 mm, alternative location based on the criteria were selected to perform water monitoring; and (2) If no suitable alternative location could be found within 15m far from the original location, the sampling at that location will be cancelled since sampling at too far from the designated location could not make a representative sample in accordance with the updated EM&A Programme (Rev. 07) (Section 4.1.4) (EPD ref.: ( ) in EP2/N7/A/52 Ax(1) Pt.20 dated 7 April 2017)

(*) Proposal for the change of water monitoring location from WM2A to WM2A(a) was verified by the IEC and it was approved by EPD. (EPD's ref. (10) in EP 2/N7/A/52 Pt.19)

(#) Proposal for the change of water quality monitoring location (WM3x and WM2A-Cx was included in the EM&A Programme Rev .05 which approved by EPD on 29 March 2016 (EPD ref.: (3) in EP2/N7/A/52 Ax(1) Pt.19)

3.4 MONITORING FREQUENCY AND PERIOD

The requirements of impact monitoring are stipulated in *Sections 2.1.6, 3.1.5* and *4.1.6* of the

approved *EM&A Manual* and presented as follows.

Air Quality Monitoring

3.4.1 Frequency of impact air quality monitoring is as follows:

- 1-hour TSP 3 times every six days during course of works
- 24-hour TSP Once every 6 days during course of works.

Noise Monitoring

3.4.2 One set of $L_{eq(30min)}$ as 6 consecutive $L_{eq(5min)}$ between 0700-1900 hours on normal weekdays and once every week during course of works. If construction work necessary to carry out at other time periods, i.e. restricted time period (19:00 to 07:00 the next morning and whole day on public holidays) (hereinafter referred as "the restricted hours"), additional weekly impact monitoring for $L_{eq(5min)}$ measurement shall be employed during respective restricted hours periods.. Supplementary information for data auditing, statistical results such as L_{10} and L_{90} shall also be obtained for reference.

Water Quality Monitoring

3.4.3 The water quality monitoring frequency shall be 3 days per week during course of works. The interval between two sets of monitoring shall not be less than 36 hours.

3.5 MONITORING EQUIPMENT

Air Quality Monitoring

3.5.1 The 24-hour and 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B.* If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, it shall submit sufficient information to the IEC to approve.

3.5.2 The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.

3.5.3 All equipment to be used for air quality monitoring is listed in ***Table 3-5***.

Table 3-5 Air Quality Monitoring Equipment

Equipment	Model
24-Hr TSP	
High Volume Air Sampler	TISCH High Volume Air Sampler, HVS Model TE-5170*
Calibration Kit	TISCH Model TE-5025A*
1-Hour TSP	
Portable Dust Meter	Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter*

** Instrument was used in the Reporting Period and the calibration certificate could be referred in Appendix F.*

Wind Data Monitoring Equipment

3.5.4 According to the approved EM&A Manual, wind data monitoring equipment shall also be provided and set up for logging wind speed and wind direction near the dust monitoring locations. The equipment installation location shall be proposed by the ET and agreed with the IEC. For installation and operation of wind data monitoring equipment, the following points shall be observed:

1) The wind sensors should be installed 10 m above ground so that they are clear of obstructions or turbulence caused by buildings.
2) The wind data should be captured by a data logger. The data shall be downloaded for analysis at least once a month.
3) The wind data monitoring equipment should be re-calibrated at least once every six months.

4) Wind direction should be divided into 16 sectors of 22.5 degrees each.

3.5.5 ET has liaised with the landlords of the successful granted HVS installation premises. However, the owners rejected to provide premises for wind data monitoring equipment installation.

3.5.6 Under this situation, the ET proposed alternative methods to obtain representative wind data. Meteorological information as extracted from "the Hong Kong Observatory Ta Kwu Ling Station" is alternative method to obtain representative wind data. For Ta Kwu Ling Station, it is located nearby the Project site. Moreover, this station is located at 15m above mean sea level while its anemometer is located at 13m above the existing ground which in compliance with the general setting up requirement. Furthermore, this station also can be to provide the humidity, rainfall, and air pressure and temperature etc. meteorological information. In Hong Kong of a lot development projects, weather information extracted from Hong Kong Observatory is common alternative method if weather station installation not allowed.

Noise Monitoring

3.5.7 Sound level meter in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out the noise monitoring. The sound level meter shall be checked using an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m/s.

3.5.8 Noise monitoring equipment to be used for monitoring is listed in ***Table 3-6***.

Table 3-6 Construction Noise Monitoring Equipment

Equipment	Model
Integrating Sound Level Meter	B&K Type 2238* or Rion NL-31* or Rion NL-52*
Calibrator	B&K Type 4231* or Quest QC-20* or Rion NC-74*
Portable Wind Speed Indicator	Testo Anemometer

** Instrument was used in the Reporting Period and the calibration certificate could be referred in Appendix F.*

3.5.9 Sound level meters listed above comply with the *International Electrotechnical Commission Publications 651: 1979 (Type 1)* and *804: 1985 (Type 1)* specifications, as recommended in TM issued under the NCO. The acoustic calibrator and sound level meter to be used in the impact monitoring will be calibrated yearly.

Water Quality Monitoring

3.5.10 DO and water temperature should be measured in-situ by a DO/temperature meter. The instrument should be portable and weatherproof using a DC power source. It should have a membrane electrode with automatic temperature compensation complete with a cable. 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 between 0 and 45 degree Celsius.

3.5.11 A portable pH meter capable of measuring a range between 0.0 and 14.0 should be provided to measure pH under the specified conditions accordingly to the APHA Standard Methods.

3.5.12 The instrument should be portable and weatherproof using a DC power source. It should have a photoelectric sensor capable of measuring turbidity between 0-1000 NTU.

3.5.13 A portable, battery-operated echo sounder or tape measure will be used for the determination of water depth at each designated monitoring station as appropriate.

3.5.14 A water sampler e.g. Kahlsico Water Sampler, which is a transparent PVC cylinder with capacity not less than 2 litres, will be used for water sampling if water depth over than 0.5m. For

sampling from very shallow water depths e.g. <0.5 m, water sample collection will be directly from water surface below 100mm use sampling plastic bottle to avoid inclusion of bottom sediment or humus. Moreover, Teflon/stainless steel bailer or self-made sampling buckets maybe used for water sampling. The equipment used for sampling will be depended the sampling location and depth situations.

3.5.15 Water samples for laboratory measurement of SS will be collected in high density polythene bottles, packed in ice (cooled to 4 ºC without being frozen), and delivered to the laboratory in the same day as the samples were collected.

3.5.16 Analysis of suspended solids should be carried out in a HOKLAS or other accredited laboratory. Water samples of about 1L should be collected at the monitoring stations for carrying out the laboratory suspended solids determination. The SS determination work should start within 24 hours after collection of the water samples. The SS analyses should follow the *APHA Standard Methods 2540D* with Limit of Reporting of 2 mg/L.

3.5.17 Water quality monitoring equipment used in the impact monitoring is listed in ***Table 3-7***. Suspended solids (SS) analysis is carried out by a local HOKLAS-accredited laboratory, namely *ALS Technichem (HK) Pty Ltd*.

Table 3-7 Water Quality Monitoring Equipment

Equipment	Model
Water Depth Detector	Eagle Sonar or tape measures
Water Sampler	A 2-litre transparent PVC cylinder with latex cups at both ends or teflon/stainless steel bailer or self-made sampling bucket
Thermometer & DO meter	YSI Professional Plus /YSI PRO20 Handheld Dissolved Oxygen Instrument/ YSI 550A Multifunctional Meter*/ YSI Professional DSS
pH meter	YSI Professional Plus / AZ8685 pH pen-style meter*/ YSI 6820/ 650MDS/ YSI Professional DSS
Turbidimeter	Hach 2100Q*/ YSI 6820/ 650MDS/ YSI Professional DSS
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	'Willow' 33-liter plastic cool box with Ice pad

** Instrument was used in the Reporting Period and the calibration certificate could be referred in Appendix F.*

3.6 MONITORING METHODOLOGY

1-hour TSP Monitoring

3.6.1 The 1-hour TSP monitor was a brand named "Sibata LD-3B Laser Dust monitor Particle Mass Profiler & Counter" which is a portable, battery-operated laser photometer. The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 90º light scattering. The 1-hour TSP monitor consists of the following:

(a.) A pump to draw sample aerosol through the optic chamber where TSP is measured;

(b.) A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and

(c.) A built-in data logger compatible with Windows based program to facilitate data collection, analysis and reporting.

3.6.2 The 1-hour TSP meter is used within the valid period as follow manufacturer's Operation and Service Manual.

24-hour TSP Monitoring

3.6.3 The equipment used for 24-hour TSP measurement is Tisch Environmental, Inc. Model TE-5170 TSP high volume air sampling system, which complied with *EPA Code of Federal Regulation, Appendix B to Part 50*. The High Volume Air Sampler (HVS) consists of the following:

(a.) An anodized aluminum shelter;
(b.) A 8"x10" stainless steel filter holder;
(c.) A blower motor assembly;
(d.) A continuous flow/pressure recorder;
(e.) A motor speed-voltage control/elapsed time indicator;
(f.) A 7-day mechanical timer, and
(g.) A power supply of 220v/50 Hz

3.6.4 The HVS is operated and calibrated on a regular basis in accordance with the manufacturer's instruction using Tisch Calibration Kit Model TE-5025A. Calibration would carry out in two month interval.

3.6.5 24-hour TSP is collected by the ET on filters of HVS and quantified by a local HOKLAS accredited laboratory, ALS Technichem (HK) Pty Ltd (ALS), upon receipt of the samples. The ET keep all the sampled 24-hour TSP filters in normal air conditioned room conditions, i.e. 70% RH (Relative Humidity) and 25°C, for six months prior to disposal.

Noise Monitoring

3.6.6 Noise measurements were taken in terms of the A-weighted equivalent sound pressure level (L_{eq}) measured in decibels dB(A). Supplementary statistical results (L_{10} and L_{90}) were also obtained for reference.

3.6.7 During the monitoring, all noise measurements would be performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (L_{eq}). $Leq_{(30min)}$ in six consecutive $Leq_{(5min)}$ measurements will use as the monitoring parameter for the time period between 0700-1900 hours on weekdays; $Leq_{(5min)}$ measurements would be used as monitoring parameter for other time periods (e.g. during restricted hours), if necessary.

3.6.8 Prior of noise measurement, the accuracy of the sound level meter is checked using an acoustic calibrator generating a known sound pressure level at a known frequency. The checking is performed before and after the noise measurement.

Water Quality

3.6.9 Water quality monitoring is conducted at the designated or alternative locations. The sampling procedures with the in-situ monitoring are presented as below:

Sampling Procedure

3.6.10 A Digital Global Positioning System (GPS) is used to identify the designated monitoring stations prior to water sampling. A portable, battery-operated echo sounder or tape measurement is used for the determination of water depth at each station. At each station, water sample would be collected from 0.1m below water surface or the water surface to prevent the river bed sediment for stirring.

3.6.11 If the water level of a monitoring station is too shallow when sampling, sediment would be disturbed which affecting the accuracy of water quality monitoring. In order to avoid disturbing sediment, depth limits should be set up for the water sampling for the ease of reference. When the measured water depth of the monitoring station (both control and impact stations) is lower than 150mm, water monitoring would not be to perform at that monitoring location. Instead, the monitoring location will be moved to a temporary alternative location monitoring location based on the criteria below:-

(a) the alternative location should be either upstream or downstream of the original location and at the same the river/drain channel
(b) the alternative location should be within 15m far from the original location
(c) if no suitable alternative location could be found within 15m far from the original location, the sampling at that location will be cancelled since sampling at too far from the designated

location could not make a representative sample.

3.6.12 The sample container will be rinsed with a portion of the water sample. The water sample then will be transferred to the high-density polythene bottles as provided by the laboratory, labeled with a unique sample number and sealed with a screw cap.

3.6.13 Before sampling, general information such as the date and time of sampling, weather condition as well as the personnel responsible for the monitoring would be recorded on the field data sheet.

3.6.14 A 'Willow' 33-liter plastic cool box packed with ice will be used to preserve the water samples prior to arrival at the laboratory for chemical determination. The water temperature of the cool box is maintained at a temperature as close to 4^0C as possible without being frozen. Samples collected are delivered to the laboratory upon collection.

In-situ Measurement

3.6.15 YSI PRO20 Handheld Dissolved Oxygen Instrument is used for water in-situ measures, which automates the measurements and data logging of temperature, dissolved oxygen and dissolved oxygen saturation.

3.6.16 A portable AZ Model 8685 is used for in-situ pH measurement. The pH meter is capable of measuring pH in the range of 0 – 14 and readable to 0.1.

3.6.17 A portable Hach 2100Q Turbidimeter is used for in-situ turbidity measurement. The turbidity meter is capable of measuring turbidity in the range of 0 – 1000 NTU.

3.6.18 All in-situ measurement equipment are calibrated by HOKLAS accredited laboratory of three month interval.

Laboratory Analysis

3.6.19 All water samples analyzed Suspended Solids (SS) will be carried out by a local HOKLAS-accredited testing laboratory (ALS Technichem (HK) Pty Ltd HOKLAS registration no. 66). SS determination using *APHA Standard Methods 2540D* as specified in the *EM&A Manual* will start within 48 hours of water sample receipt.

3.7 EQUIPMENT CALIBRATION

3.7.1 Calibration of the HVS is performed upon installation and thereafter at bimonthly intervals in accordance with the manufacturer's instruction using the certified standard calibrator (TISCH Model TE-5025A). Moreover, the Calibration Kit would be calibrated annually. The calibration data are properly documented and the records are maintained by ET for future reference.

3.7.2 The 1-hour TSP meter was calibrated by the supplier prior to purchase. Zero response of the equipment would be checked before and after each monitoring event. Annually calibration with the High Volume Sampler (HVS) in same condition would be undertaken by the Laboratory.

3.7.3 The sound level meter and calibrator are calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme at yearly basis.

3.7.4 All water quality monitoring equipment would be calibrated by HOKLAS accredited laboratory of three month intervals.

3.7.5 The calibration certificates of all monitoring equipment used for the impact monitoring program in the Reporting Period and the HOKLAS accredited certificate of laboratory are attached in ***Appendix F***.

3.8 DERIVATION OF ACTION/LIMIT (A/L) LEVELS

3.8.1 The baseline results form the basis for determining the environmental acceptance criteria for the impact monitoring. According to the approved Environmental Monitoring and Audit Manual, the air quality, construction noise and water quality criteria were set up, namely Action and Limit levels are listed in ***Tables 3-8, 3-9*** and ***3-10***.

Table 3-8 Action and Limit Levels for Air Quality Monitoring

Monitoring Station	Action Level (μg /m^3)		Limit Level (μg/m^3)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
AM1b	265	143	500	260
AM2	268	149		
AM3	269	145		
AM4b	267	148		
AM5a	268	143		
AM6	269	148		
AM7b	275	156		
AM8	269	144		
AM9b	271	151		

Table 3-9 Action and Limit Levels for Construction Noise

Monitoring Location	Action Level	Limit Level in dB(A)
	Time Period: 0700-1900 hours on normal weekdays	
NM1, NM2a, NM3, NM4, NM5, NM6, NM7, NM8, NM9, NM10	When one or more documented complaints are received	75 dB(A)[Note 1 & Note 2]

Note 1: Acceptable Noise Levels for school should be reduced to 70 dB(A) and65 dB(A) during examination period.

Note 2: If works are to be carried out during restricted hours, the conditions stipulated in the construction noise permit issued by the NCA have to be followed.

Table 3-10 Action and Limit Levels for Water Quality

Parameter	Performance criteria	Monitoring Location				
		WM1	WM2A(a)	WM2B	WM3x	WM4
DO (mg/L)	Action Level	(*)4.23	(**)4.00	(*)4.74	(**)4.00	(*)4.14
	Limit Level	(#)4.19	(**)4.00	(#)4.60	(**)4.00	(#)4.08
Turbidity (NTU)	Action Level	51.3	24.9	11.4	13.4	35.2
		AND 120% of upstream control station of the same day				
	Limit Level	67.6	33.8	12.3	14.0	38.4
		AND 130% of upstream control station of the same day				
SS (mg/L)	Action Level	54.5	14.6	11.8	12.6	39.4
		AND 120% of upstream control station of the same day				
	Limit Level	64.9	17.3	12.4	12.9	45.5
		AND 130% of upstream control station of the same day				

Remarks:

(*) *The Proposed **Action Level** of Dissolved Oxygen is adopted to be used 5%-ile of baseline data*

(**) *The Proposed **Action & Limit Level** of Dissolved Oxygen is used 4mg/L*

(#) *The Proposed **Limit Level** of Dissolved Oxygen is adopted to be used 1%-ile of baseline data*

3.8.2 Should non-compliance of the environmental quality criteria occurs, remedial actions will be triggered according to the Event and Action Plan which presented in ***Appendix G.***

3.9 DATA MANAGEMENT AND DATA QA/QC CONTROL

3.9.1 All monitoring data will be handled by the ET's in-house data recording and management system.

The monitoring data recorded in the equipment will be downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data will input into a computerized database maintained by the ET. The laboratory results will be input directly into the computerized database and checked by personnel other than those who input the data.

3.9.2 For monitoring parameters that require laboratory analysis, the local laboratory shall follow the QA/QC requirements as set out under the HOKLAS scheme for the relevant laboratory tests.

4 AIR QUALITY MONITORING

4.1 GENERAL

4.1.1 In the Reporting Period, construction works under the project have been commenced in Contracts 2, 3, 4, 6, 7 and Contract SS C505. Hence, air quality monitoring was performed at all designated locations.

4.1.2 The air quality monitoring schedule is presented in ***Appendix H*** and the monitoring results are summarized in the following sub-sections.

4.2 AIR QUALITY MONITORING RESULTS

4.2.1 In the Reporting Period, a total of ***147*** events of 1-hour TSP and ***54*** events 24-hours TSP monitoring were carried out and the monitoring results are summarized in ***Tables 4-1 to 4-9***. The detailed 24-hour TSP monitoring data are presented in ***Appendix I*** and the relevant graphical plots are shown in ***Appendix J***.

Table 4-1 Summary of 24-hour and 1-hour TSP Monitoring Results – AM1b

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
1-Jan-18	136	2-Jan-18	9:37	77	79	80
6-Jan-18	24	8-Jan-18	10:34	22	24	27
12-Jan-18	73	13-Jan-18	9:11	68	71	73
18-Jan-18	78	19-Jan-18	10:08	61	61	56
24-Jan-18	106	25-Jan-18	9:26	68	70	71
30-Jan-18	62	31-Jan-18	9:29	27	33	40
Average (Range)	**80 (24 – 136)**	Average (Range)		**56 (22 – 80)**		

Table 4-2 Summary of 24-hour and 1-hour TSP Monitoring Results – AM2

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
1-Jan-18	146	2-Jan-18	9:31	78	80	81
6-Jan-18	42	8-Jan-18	10:31	25	25	28
12-Jan-18	129	13-Jan-18	9:14	66	69	71
18-Jan-18	147	19-Jan-18	10:04	71	69	71
24-Jan-18	142	25-Jan-18	9:14	71	74	74
30-Jan-18	84	31-Jan-18	9:25	28	30	37
Average (Range)	**115 (42 – 147)**	Average (Range)		**58 (25 – 81)**		

Table 4-3 Summary of 24-hour and 1-hour TSP Monitoring Results – AM3

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
1-Jan-18	85	2-Jan-17	9:41	79	82	78
6-Jan-18	21	8-Jan-18	10:28	27	25	32
12-Jan-18	79	13-Jan-18	9:17	70	73	75
18-Jan-18	97	19-Jan-18	10:01	77	78	75
24-Jan-18	83	25-Jan-18	13:12	75	78	73
30-Jan-18	93	31-Jan-18	9:22	28	32	40
Average (Range)	**76 (21 – 97)**	Average (Range)		**61 (25 – 82)**		

Table 4-4 Summary of 24-hour and 1-hour TSP Monitoring Results – AM4b

Date	24-hour TSP ($\mu g/m^3$)	1-hour TSP ($\mu g/m^3$)				
		Date	Start Time	1st reading	2nd reading	3rd reading
2-Jan-18	142	4-Jan-18	9:35	77	84	87
8-Jan-18	31	10-Jan-18	10:24	71	62	71
13-Jan-18	69	16-Jan-18	9:41	40	44	45
19-Jan-18	77	22-Jan-18	9:18	60	44	47
25-Jan-18	75	27-Jan-18	8:51	66	66	69
31-Jan-18	23					
Average (Range)	**70 (23 – 142)**	Average (Range)		**62 (40 – 87)**		

Table 4-5 Summary of 24-hour and 1-hour TSP Monitoring Results – AM5a

Date	24-hour TSP ($\mu g/m^3$)	1-hour TSP ($\mu g/m^3$)				
		Date	Start Time	1st reading	2nd reading	3rd reading
2-Jan-18	86	4-Jan-18	9:33	81	79	79
8-Jan-18	12	10-Jan-18	10:13	80	77	80
13-Jan-18	22	16-Jan-17	9:38	40	44	51
19-Jan-18	88	22-Jan-18	10:46	61	57	61
25-Jan-18	126	27-Jan-18	8:49	59	59	54
31-Jan-18	40					
Average (Range)	**62 (12 – 126)**	Average (Range)		**64 (40 – 81)**		

Table 4-6 Summary of 24-hour and 1-hour TSP Monitoring Results – AM6

Date	24-hour TSP ($\mu g/m^3$)	1-hour TSP ($\mu g/m^3$)				
		Date	Start Time	1st reading	2nd reading	3rd reading
2-Jan-18	112	4-Jan-18	9:27	80	82	82
8-Jan-18	22	10-Jan-18	9:39	97	91	99
13-Jan-18	104	16-Jan-18	9:31	42	43	49
19-Jan-18	57	22-Jan-18	10:07	63	61	63
25-Jan-18	99	27-Jan-18	8:59	72	72	69
31-Jan-18	39					
Average (Range)	**72 (22 – 112)**	Average (Range)		**71 (42 – 99)**		

Table 4-7 Summary of 24-hour and 1-hour TSP Monitoring Results – AM7b

Date	24-hour TSP ($\mu g/m^3$)	1-hour TSP ($\mu g/m^3$)				
		Date	Start Time	1st reading	2nd reading	3rd reading
2-Jan-18	153	4-Jan-18	9:23	93	99	96
8-Jan-18	23	10-Jan-18	9:21	109	115	116
13-Jan-18	115	16-Jan-18	9:25	44	45	51
19-Jan-18	105	22-Jan-18	11:23	68	71	72
25-Jan-18	147	27-Jan-18	9:08	71	78	72
31-Jan-18	48					
Average (Range)	**99 (23 – 153)**	Average (Range)		**80 (44 – 116)**		

Table 4-8 Summary of 24-hour and 1-hour TSP Monitoring Results – AM8

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
2-Jan-18	116	4-Jan-18	9:15	80	82	84
8-Jan-18	19	10-Jan-18	11:03	65	66	61
13-Jan-18	67	16-Jan-18	9:16	42	45	49
19-Jan-18	50	22-Jan-18	13:15	59	63	64
25-Jan-18	35	27-Jan-18	13:19	71	70	65
31-Jan-18	32					
Average (Range)	**53 (19 – 116)**	Average (Range)		**64 (42 – 84)**		

Table 4-9 Summary of 24-hour and 1-hour TSP Monitoring Results – AM9b

Date	24-hour TSP (μg/m³)	1-hour TSP (μg/m³)				
		Date	Start Time	1st reading	2nd reading	3rd reading
1-Jan-18	143	2-Jan-18	9:13	73	74	77
6-Jan-18	67	8-Jan-18	13:15	52	51	50
12-Jan-18	50	13-Jan-18	8:47	59	62	64
18-Jan-18	29	19-Jan-18	9:25	45	47	55
24-Jan-18	119	25-Jan-18	9:50	107	102	92
30-Jan-18	70	31-Jan-18	9:40	59	61	63
Average (Range)	**80 (29 – 143)**	Average (Range)		**66 (45 – 107)**		

4.2.2 As shown in ***Tables 4-1 to 4-9***, all the 1-hour TSP and 24-hour TSP monitoring results were below the Action/Limit Levels. No Notification of Exceedance (NOE) was issued in this Reporting Period.

4.2.3 The meteorological data during the impact monitoring days are summarized in ***Appendix K***.

5 CONSTRUCTION NOISE MONITORING

5.1 GENERAL

5.1.1 In the Reporting Period, construction works under the project have been commenced in Contracts 2, 3, 4, 6, 7 and Contract SS C505 and noise monitoring was performed at all designated locations.

5.1.2 The noise monitoring schedule is presented in ***Appendix H*** and the monitoring results are summarized in the following sub-sections.

5.2 NOISE MONITORING RESULTS

5.2.1 In the Reporting Period, a total of **45** events noise measurements were carried out at the designated locations. The sound level meter was set in 1m from the exterior of the building façade including noise monitoring locations NM1, NM3, NM4, NM5, NM6, NM7, NM8 and NM9. Therefore, no façade correction (+3 dB(A)) is added according to acoustical principles and EPD guidelines. However, free-field status were performed at NM2a and NM10 and façade correction (+3 dB(A)) has added according to the requirement in this month. The noise monitoring results at the designated locations are summarized in ***Tables 5-1 and 5-2.*** The detailed noise monitoring data are presented in ***Appendix I*** and the relevant graphical plots are shown in ***Appendix J***.

Table 5-1 Summary of Construction Noise Monitoring Results

Construction Noise Level ($L_{eq30min}$), dB(A)					
Date	**NM1**	**NM2a(*)**	**NM8**	**NM9**	**NM10(*)**
2-Jan-18	59	74	63	64	67
8-Jan-18	61	69	64	70	66
19-Jan-18	56	67	62	63	65
25-Jan-18	46	69	58	59	61
31-Jan-18	58	69	56	69	66
Limit Level	**75 dB(A)**				

Remarks

(*) *façade correction (+3 dB(A) is added according to acoustical principles and EPD guidelines*

Table 5-2 Summary of Construction Noise Monitoring Results

Construction Noise Level ($L_{eq30min}$), dB(A)					
Date	**NM3**	**NM4**	**NM5**	**NM6**	**NM7**
4-Jan-18	62	64	53	58	59
10-Jan-18	58	68	54	60	57
16-Jan-18	63	64	51	58	60
22-Jan-18	63	63	53	58	59
Limit Level	**75 dB(A)**				

5.2.2 As shown in ***Tables 5-1 and 5-2***, no construction noise measurement results that exceeded the Limit Level were recorded. Moreover, no valid noise complaint (which triggered Action Level exceedance) was recorded in the Reporting Period.

6 WATER QUALITY MONITORING

6.1 GENERAL

6.1.1 In the Reporting Period, construction works under the project has been commenced in Contracts 2, 3, 4, 6, 7 and Contract SS C505 and water quality monitoring was performed at all designated locations. The water quality monitoring schedule is presented in ***Appendix H***. The monitoring results are summarized in the following sub-sections.

6.2 RESULTS OF WATER QUALITY MONITORING

6.2.1 In the Reporting Period, a total of fourteen (14) sampling days was scheduled to carry out for all designated locations with their control stations. Since exceedances were recorded at WM2A(a) and WM3x, according to "*Event and Action Plan*" stipulation, 4 and 2 additional water quality monitoring day were conducted for WM2A(a) and WM3x and its control stations..

6.2.2 During water monitoring on 2 to 12 January 2018, the access of WM2A(a) for water sampling was demolished due to the construction work. Therefore, WM2A(a) was temporarily shifted to upstream near Nylon Dam, which was the only accessible and safe platform to carry out water sampling. The temporary location of WM2A(a) is indicated in ***Appendix E***. Sampling at WM2A(a) was resumed to the designated location on 13 January 2018 with the new access provided.

6.2.3 The key monitoring parameters including Dissolved Oxygen, Turbidity and Suspended Solids are summarized in ***Tables 6-1 to 6-5***. Breaches of water quality monitoring criteria are shown in ***Table 6-6***. Detailed monitoring database including in-situ measurements and laboratory analysis data are shown in ***Appendix I*** and the relevant graphical plot are shown in ***Appendix J***.

Table 6-1 Water Quality Monitoring Results Associated of Contracts 2 and 3

Date	Dissolved Oxygen (mg/L)			Turbidity (NTU)			Suspended Solids (mg/L)		
	WM4	WM4-CA	WM4-CB	WM4	WM4-CA	WM4-CB	WM4	WM4-CA	WM4-CB
2-Jan-18	8.5	9.0	8.1	8.2	5.3	7.8	10.5	11.0	4.5
4-Jan-18	6.8	9.3	5.6	6.0	3.2	19.8	4.0	<2	20.0
6-Jan-18	7.8	9.0	6.5	30.2	7.2	14.8	25.5	2.5	10.5
8-Jan-18	7.7	9.2	6.5	28.1	3.3	14.2	25.5	<2	12.0
10-Jan-18	9.3	12.3	7.8	18.8	4.9	10.5	16.0	<2	7.0
13-Jan-18	9.4	11.5	7.4	11.7	4.1	5.3	5.5	<2	4.5
16-Jan-18	6.6	9.3	7.4	10.4	3.8	6.0	14.0	3.0	6.5
18-Jan-18	7.5	9.3	6.4	9.2	1.7	5.3	10.0	<2	4.5
20-Jan-18	7.8	8.9	5.3	15.3	7.5	12.3	19.0	<2	18.0
22-Jan-18	5.8	7.5	5.7	14.2	4.3	9.0	19.5	<2	7.5
24-Jan-18	7.8	10.1	7.4	8.8	1.7	11.2	10.0	<2	11.5
27-Jan-18	7.7	10.5	6.5	11.2	5.7	9.4	6.0	<2	8.0
29-Jan-18	10.2	12.2	9.1	6.1	4.6	7.7	7.0	<2	4.0
31-Jan-18	10.8	11.8	8.4	27.8	4.4	25.9	26.0	4.0	25.5

Table 6-2 Water Quality Monitoring Results Associated of Contracts 6 and SS C505

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM1	WM1-C	WM1	WM1-C	WM1	WM1-C
4-Jan-18	10.5	7.9	5.4	7.5	3.5	4.5
6-Jan-18	9.9	10.5	5.2	20.3	<2	19.5
8-Jan-18	8.0	8.3	6.8	12.9	2.5	8.0
10-Jan-18	8.8	6.6	39.7	25.5	24.5	21.0
13-Jan-18	12.9	11.8	51.1	43.3	35.0	20.0
16-Jan-18	7.0	8.2	42.8	13.2	33.5	5.0
18-Jan-18	9.4	8.0	14.4	21.4	9.5	17.0
20-Jan-18	8.7	6.3	18.5	41.3	18.0	32.5

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM1	WM1-C	WM1	WM1-C	WM1	WM1-C
22-Jan-18	5.6	4.2	10.6	18.8	9.5	18.0
24-Jan-18	10.0	7.4	14.0	20.7	9.0	19.0
27-Jan-18	11.2	8.3	13.9	60.5	9.0	49.0
29-Jan-18	15.1	12.4	10.0	34.0	4.5	30.0
31-Jan-18	13.7	15.2	8.9	9.7	4.0	5.5

Table 6-3 Water Quality Monitoring Results Associated only Contract 6

Date	Dissolved Oxygen (mg/L)				Turbidity (NTU)				Suspended Solids (mg/L)			
	WM2A(a)	WM2A-Cx	WM2B	WM2B-C	WM2A(a)	WM2A - Cx	WM2B	WM2B-C	WM2A(a)	WM2A-Cx	WM2B	WM2B- C
2-Jan-18	7.1	9.4	*	*	12.1	8.9	*	*	7.5	<2	*	*
4-Jan-18	6.8	8.3	*	*	11.4	13.7	*	*	5.5	3.0	*	*
6-Jan-18	7.5	9.7	*	*	17.8	65.9	*	*	11.0	30.0	*	*
8-Jan-18	8.6	9.8	*	*	**71.3**	27.6	*	*	**34.0**	11.0	*	*
9-Jan-18#	#	#	*	*	***290.5***	45.1	*	*	***158.0***	23.0	*	*
10-Jan-18	8.3	10.5	*	*	***115.0***	43.5	*	*	***62.0***	19.5	*	*
11-Jan-18#	#	#	*	*	***67.2***	35.0	*	*	***52.0***	18.0	*	*
12-Jan-18#	#	#	*	*	***39.1***	24.8	*	*	***20.0***	16.0	*	*
13-Jan-18	12.7	11.8	*	*	***58.3***	26.7	*	*	***34.5***	7.0	*	*
15-Jan-18#	#	#	*	*	14.0	13.4	*	*	8.0	9.0	*	*
16-Jan-18	9.2	7.8	*	*	10.0	18.2	*	*	4.5	7.0	*	*
18-Jan-18	9.3	8.3	*	*	22.8	17.4	*	*	7.0	6.0	*	*
20-Jan-18	9.8	9.4	*	*	17.0	17.5	*	*	10.5	5.0	*	*
22-Jan-18	7.7	6.2	*	*	14.3	19.6	*	*	7.0	5.5	*	*
24-Jan-18	9.9	8.8	*	*	7.7	26.3	*	*	3.5	11.0	*	*
27-Jan-18	10.7	9.7	*	*	14.8	27.0	*	*	5.5	8.0	*	*
29-Jan-18	14.1	13.4	*	*	10.0	19.3	*	*	4.0	9.5	*	*
31-Jan-18	12.8	13.6	*	*	516.5	777.0	*	*	268.5	408.0	*	*

Remarks:

** water sampling was unable to carry out at WM2B and WM2B-C due to shallow water (water depth under 150mm*

 # Additional water quality monitoring at the exceeded location(s) due to two consecutive *monitoring days indicated Limit Level exceedance.*

bold with italic indicated Action Level exceedance; bold with underline indicated Limit Level exceedance

Table 6-4 Water Quality Monitoring Results Associated Contracts 2 and 6

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM3x	WM3-C	WM3x	WM3-C	WM3x	WM3-C
2-Jan-18	9.0	9.8	11.1	5.3	5.0	13.5
4-Jan-18	9.1	9.7	7.6	3.3	5.0	9.5
6-Jan-18	9.6	11.2	9.4	10.8	7.0	15.5
8-Jan-18	9.5	10.1	**20.0**	3.3	**14.5**	3.0
9-Jan-18#	#	#	12.3	7.3	9.0	7.0
10-Jan-18	11.3	15.7	18.2	18.3	8.0	25.0
13-Jan-18	12.0	13.9	11.2	21.6	8.5	13.5
16-Jan-18	7.0	9.4	13.3	10.0	12.0	35.5
18-Jun-18	8.9	9.8	8.7	5.0	8.0	9.0
20-Jan-18	11.0	13.3	4.3	3.1	3.0	2.5
22-Jan-18	9.0	9.2	13.1	7.0	12.0	12.0
24-Jan-18	9.5	10.2	10.0	4.2	6.5	4.0
27-Jan-18	10.5	13.6	**152.5**	9.7	**669.5**	8.0
29-Jan-18	13.0	17.1	4.6	8.3	<2	13.5
30-Jan-18	#	#	3.4	5.9	3.0	16.0

Date	Dissolved Oxygen (mg/L)		Turbidity (NTU)		Suspended Solids (mg/L)	
	WM3x	WM3-C	WM3x	WM3-C	WM3x	WM3-C
31-Jan-18	11.5	12.6	13.1	12.4	12.0	9.0

Remarks:

 # Additional water quality monitoring at the exceeded location(s) due to two consecutive *monitoring days indicated Limit Level exceedance.*
bold with underline indicated Limit Level exceedance

Table 6-5 Action and Limit (A/L) Levels Exceedance Recorded

Location	Dissolved Oxygen		Turbidity		Suspended Solids		Total Exceedance		Project Related exceedance	
	AL	LL	AL	LL	AL	LL	AL	LL	AL	LL
WM1	0	0	0	0	0	0	0	0	0	0
WM2A(a)	0	0	0	**6**	**1**	**5**	**1**	**11**	0	0
WM2B	0	0	0	0	0	0	0	0	0	0
WM3x	0	0	0	**2**	0	**2**	0	**4**	0	0
WM4	0	0	0	0	0	0	0	0	0	0
No of Exceedance	0	0	0	**8**	**1**	**7**	**1**	**15**	0	0

6.2.4 In this Reporting Period, a total of sixteen (16) Action/ Limit Level exceedances, namely eight (8) Limit Level exceedance of turbidity and eight (8) Action/ Limit Level exceedances of Suspended Solids were recorded for the Project and they are summarized in ***Table 6-5***. Investigation Reports for all water quality exceedances were completed by ET. Investigation results revealed that the Contractor had properly implemented water quality mitigation measures such as covering the expose area with tarpaulin sheet and provided bunds align the watercourse. It was concluded that the exceedances recorded at WM2A(a) on 8 to 13 January 2018 and WM3x on 8 January 2018 were completed were related to the impact of rainstorm and not caused by the works under the Project. For exceedances recorded atWM3x on 27 January 2018, it was concluded that the exceedances were related to the external source of turbid water and not project related.

6.2.5 NOE was issued to relevant parties upon confirmation of the monitoring result. The investigation results and summary of exceedances are summarized in ***Table 6-6***. The details of the completed investigation reports for the exceedances are attached in ***Appendix N***.

Table 6-6 Summary of Water Quality Exceedance in the Reporting Period

Date of Exceedance	Location	Exceeded Parameter	Cause of Water Quality Exceedance In Brief
29 Dec 2017 (last Reporting Period)	WM4	NTU & SS	In our investigation, no adverse water quality impact was observed during the site inspection. Moreover, there were no rainfall record on 29 December 2017 and muddy runoff from the site area was unlikely to occur. It was considered that the exceedances were unlikely caused by the works under Contracts 2 and 3. Nevertheless, the Contractor of Contract 3 was advised to continuously improve the mitigation measures to muddy surface from construction site entering the diverted flow specifically during rain and potential muddy runoff generated by watering during dusty work.
8, 9, 10, 11, 12 and 13 Jan 2018	WM2A(a)	NTU & SS	According to the weather information from the Observatory, successive heavy rainstorm was recorded during 7 to 9 January 2018. The water quality throughout the river course was highly affected by the stirred up sediment and muddy runoff from the surrounding environment even outside the construction site. The muddy water was trapped at the Nylon Dam at

			intermediate of the construction site. In our investigation, the Contractor had implemented water quality mitigation measures such as providing temporary bund and tarpaulin sheet align the river course, there were no adverse water quality impact observed during the site inspection. Since the existing river water was found turbid even without adverse water impact of the site and muddy water was also observed at upstream during the exceedance days, it is considered that the exceedances were related to the impact of rainstorm.
8 Jan 2018	WM3x	NTU & SS	According to weather record from the Observatory, there was heavy rainstorm on 8 January 2018 and the water quality in the river course was deteriorated by rain and stirred up sediment. Moreover, storm water from road surface of Sha Tau Kok Road entering WM3x was noted during rainy day. It was concluded that the exceedances were caused by the rain.
27 Jan 2018	WM3x	NTU & SS	Inspection was carried out at upstream of WM3x, a vehicle was found parked on the access road in Ng Tung River, suspecting for channel maintenance by other party and turbid water was observed since there. The Contractor of Contracts 2 and 6 explained that the vehicle was not belonging to them as they have no permit to access the channel area. Moreover, it was observed that the water quality from North Portal Site and Admin Building Site under Contract 2 and South Portal under Contact 6 were clear and no deteriorated water quality was noted from both Sites. It is considered that the exceedances were related to other source of turbid water and not caused by the works under Contract 2.

7 ECOLOGY MONITORING

7.1 GENERAL

7.1.1 Ecology monitoring for woodland compensation was shall be conducted at bi-monthly interval for the first year and the monitoring frequency would be reduced to quarterly from the second year.

7.1.2 The last Quarterly Ecological Monitoring Report (Sep - Nov 2017) was submitted to EPD in December 2017 as standalone as supplementary of the EM&A Report. No Ecological Monitoring Report will be submitted in the Reporting Period.

8 WASTE MANAGEMENT

8.1 GENERAL WASTE MANAGEMENT

8.1.1 Waste management was carried out in accordance with the Waste Management Plan (WMP) for each contract.

8.2 RECORDS OF WASTE QUANTITIES

8.2.1 All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil.

8.2.2 The quantities of waste for disposal in this Reporting Period are summarized in ***Tables 8-1*** and ***8-2*** and the Monthly Summary Waste Flow Table is shown in ***Appendix L***. Whenever possible, materials were reused on-site as far as practicable.

Table 8-1 Summary of Quantities of Inert C&D Materials for the Project

Type of Waste	Contract 2		Contract 3		Contract 4		Contract 6		Contract 7		Contract SS C505		Total Qty.
	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	
C&D Materials (Inert) (in '000m^3)	**86.6400**	--	**3.089**	--	0	--	**4.152**	--	**0.015**	--	**5.298**	--	**99.194**
Reused in this Contract (Inert) (in '000 m^3)	0	--	**0.060**	--	0	--	**0.629**	--	0	--	**0.160**	--	**0.849**
Reused in other Contracts/ Projects (Inert) (in '000 m^3)	**5.2900**	Recycling facility as approved alternative site	0	--	0	--	**1.947**	NENT	0	--	0	--	**7.237**
Disposal as Public Fill (Inert) (in '000 m^3)	**81.3500**	Tuen Mun 38	**2.725**	Tuen Mun 38	0	--	**1.576**	Tuen Mun 38	**0.015**	Tuen Mun 38	**4.492**	TKO 137	**90.158**

Table 8-2 Summary of Quantities of C&D Wastes for the Project

Type of Waste	Contract 2		Contract 3		Contract 4		Contract 6		Contract 7		Contract SS C505		Total Quantity
	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	Qty.	Disposal location	
Recycled Metal ('000kg) #	**45.00**	Licensed collector	0	-	0	--	0	--	**14.5**	Licensed collector	**375.870**	Licensed collector	**435.57**
Recycled Paper / Cardboard Packing ('000kg) #	**0.3100**	Licensed collector	0	-	0	-	**0.240**	Licensed collector	**0.5**	Licensed collector	**0.220**	Licensed collector	**1.27**
Recycled Plastic ('000kg) #	**2.8000**	Licensed collector	0	-	0	--	0	--	**0.001**	Licensed collector	**0.032**	Licensed collector	**2.833**
Chemical Wastes ('000kg) #	**4.5760**	Licensed collector	0	-	0	--	0	--	0	--	0	--	**4.576**
General Refuses ('000m^3)	**0.6575**	NENT	**0.150**	NENT	0	--	**0.892**	NENT	**0.15**	NENT	**1.918**	NENT	**3.7675**

Remark #: Unit of recycled metal, recycled paper/ cardboard packing, recycled plastic and chemical waste for Contract 3 was in ('000m^3).

9 SITE INSPECTION

9.1 REQUIREMENTS

9.1.1 According to the approved EM&A Manual, the environmental site inspection shall be formulation by ET Leader. Weekly environmental site inspections should carry out to confirm the environmental performance.

9.2 FINDINGS / DEFICIENCIES DURING THE REPORTING MONTH

Contract 2

9.2.1 In the Reporting Period, joint site inspection for Contract 2 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **5, 12, 19 and 25 January 2018**. No non-compliance was noted.

9.2.2 The findings / deficiencies of ***Contract 2*** that observed during the weekly site inspection are listed in ***Table 9-1***.

Table 9-1 Site Observations for Contract 2

Date	Findings / Deficiencies	Follow-Up Status
5 Jan 2018	• The effluent discharged from North Portal Site appeared to be silty. The Contractor should make sure all discharge from site comply with the WPCO requirements.	• The effluent quality was improved after emergency repair of the MS plant.
12 Jan 2018	• Free standing chemical containers were observed near sedimentation tanks. The Contractor was advised to provide drip tray for all chemical containers to avoid leakage on ground. (North Portal) • The Contractor was reminded to remove the air compressor away from discharge point if practicable and provide proper mitigation measure to avoid oil leakage (South Portal). • The Contractor was reminded to have proper maintenance on the sedimentation system to ensure the PH value compiles with discharge license (South Portal).	• The chemical containers have been removed • Not required for reminder. • Not required for reminder.
19 Jan 2018	• The Contractor was reminded to provide mitigation measures for the chemical container to prevent potential leakage.	• Not required for reminder.
25 Jan 2018	• Dust emission during unloading of fill material was observed, the Contractor should provide dust suppression measures for unloading activities. (Mid-vent) • The Contractor was reminded to properly maintain the pH meter of the wastewater treatment facility in Mid-vent and to comply with the discharge licence. • It was reminded that the broken water fill barriers should be maintained or replaced to prevent mosquito breeding. • The Contractor was reminded to complete the checklist/inspection for wastewater treatment facility on regular basis.	• Construction dust was suppressed by water spraying. • Not required for reminder. • Not required for reminder. • Not required for reminder.

Contract 3

9.2.3 In the Reporting Period, joint site inspection for Contract 3 to evaluate the site environmental

performance has been carried out by the RE, IEC, ET and the Contractor on **4, 11, 17 and 25 January 2018**. No non-compliance was noted.

9.2.4 The findings / deficiencies of ***Contract 3*** that observed during the weekly site inspection are listed in ***Table 9-2***.

Table 9-2 Site Observations for Contract 3

Date	Findings / Deficiencies	Follow-Up Status
4 Jan 2018	• Open slope at BC02 was observed, the Contractor should provide mitigation measures such as tarpaulin sheet to avoid rainwater surface runoff	• The slope was covered with tarpaulin sheets and sandbag bunds were provided to prevent surface runoff into the watercourse.
11 Jan 2018	• It was reminded that the condition of slope at BC02 should be properly maintained to avoid surface runoff get into the river.	• Not required for reminder.
17 Jan 2018	• Turbid discharge from the wastewater treatment facility was observed, the Contractor should properly maintain the treatment system and ensure the discharge compiled with the relevant license requirement. (ID4)	• The wastewater treatment facility was maintained and no turbid water was discharged through the treatment system at ID4.
25 Jan 2018	• No adverse environmental issue was observed.	NA

Contract 4

9.2.5 In the Reporting Period, joint site inspection for Contract 4 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **5, 12, 15 and 26 January 2018**. No non-compliance was noted.

9.2.6 The findings / deficiencies of ***Contract 4*** that observed during the weekly site inspection are listed in ***Table 9-3***.

Table 9-3 Site Observations for Contract 4

Date	Findings / Deficiencies	Follow-Up Status
5 Jan 2018	• No adverse environmental issue was observed.	• NA
12 Jan 2018	• No adverse environmental issue was observed.	• NA
15 Jan 2018	• No adverse environmental issue was observed.	• NA
26 Jan 2018	• No adverse environmental issue was observed.	• NA

Contract 6

9.2.7 In the Reporting Period, joint site inspection for Contract 6 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **4, 11, 18 and 26 January 2018**. No non-compliance was noted.

9.2.8 The findings / deficiencies of ***Contract 6*** that observed during the weekly site inspection are listed in ***Table 9-4***.

Table 9-4 Site Observations for Contract 6

Date	Findings / Deficiencies	Follow-Up Status
4 Jan 2018	• The Contractor was reminded to maintain road	• Not required for

Date	Findings / Deficiencies	Follow-Up Status
	cleanliness at Ping Yeung Interchange.	reminder.
11 Jan 2018	• The Contractor was reminded to maintain cleanliness at the site exit/entrance in STK road.	• Not required for reminder.
18 Jan 2018	• No adverse environmental issue was observed.	• NA
26 Jan 2018	• NRMM label should be displayed properly during the generator is operated. (Bridge A)	• NRMM label was displayed properly for the generator.

Contract SS C505

9.2.9 In the Reporting Period, joint site inspection for Contract SS C505 to evaluate the site environmental performance has been carried out by the RE, ET and the Contractor on **3, 10, 17, 24 and 31 January 2018** in which IEC joined the site inspection on **24 January 2018**. No non-compliance was noted.

9.2.10 The findings / deficiencies of ***Contract SS C505*** that observed during the weekly site inspection are listed in ***Table 9-5***.

Table 9-5 Site Observations for Contract SS C505

Date	Findings / Deficiencies	Follow-Up Status
3 Jan 2018	• The Contractor was reminded to clear the stagnant water on the ground floor of PTB.	• Oil drum was removed within site area.
10 Jan 2018	• No adverse environmental issue was observed.	• NA
17 Jan 2018	• Chemical containers were observed on the ground floor of PTB. The Contractor was advised to provide drip tray to chemical containers to avoid leakage.	• Chemical containers were removed from site.
24 Jan 2018	• Oil leakage was observed on the ground at the work area of PTB. The Contractor was advised to clean the oil leakage and dispose of as chemical waste. • Diesel containers were observed at the roof floor of PTB. The Contractor was advised to provide drip tray for diesel containers to avoid oil leakage. • The Contractor was reminded to enhance house-keeping within work area of PTB.	• Oil leakage was cleared and disposed as chemical waste. . • Diesel containers were removed. • Not required for reminder.
31 Jan 2018	• Oil drums were observed on the ground next to PTB. The Contractor was advised to place oil drums inside drip tray to avoid oil leakage.	• Not required for reminder.

Contract 7

9.2.11 In the Reporting Period, joint site inspection for Contract 7 to evaluate the site environmental performance has been carried out by the RE, IEC, ET and the Contractor on **5, 12, 16 and 26 January 2018**. No non-compliance was noted.

9.2.12 The findings / deficiencies of ***Contract 7*** that observed during the weekly site inspection are listed in ***Table 9-6***.

Table 9-6 Site Observations for Contract 7

Date	Findings / Deficiencies	Follow-Up Status
5 Jan 2018	• No adverse environmental issue was observed during site inspection.	• NA.
12 Jan 2018	• Unsatisfactory water quality was observed at sedimentation tanks. The Contractor was advised to maintain the sedimentation tank regularly.	• Water quality in sedimentation tank was improved.
16 Jan 2018	• No adverse environmental issue was observed during site inspection.	• NA.
26 Jan 2018	• No adverse environmental issue was observed during site inspection.	• NA.

9.2.13 General housekeeping such as daily site tidiness and cleanliness should be maintained for all Contracts. Furthermore, the Contractors were reminded to implement Waste Management Plan of the Project.

10 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

10.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTIONS

10.1.1 In the Reporting Period, no summons and prosecution under the EM&A Programme was lodged for all Contracts. However, one (1) documented environmental complaint was received regarding waste management under the EM&A Programme and the details are summarized below. The status of the investigation report and finding and listed below.

Date of complaint	Complaint Detail	Investigation Status
28 December 2017	A public complaint was received by CEDD regarding noise nuisance causing by operation of excavator at 11:02pm which affecting the rest time. The complainant requested the relevant department to follow up and resolve the problem. However, there was lack of information about complaint location as it did not mention in the complainant's e-mail and no photo was provided.	Draft Investigation Report was issued by ET. Based on the information provided by CCKJV, there should not be any operation of excavator between 23:00 and 07:00 of next day. The works carried out at during restricted hours did not breach the CNP requirement. Nevertheless, CCKJV was reminded not to violate CNP conditions. The draft IR is under reviewed by IEC.
24 January 2018	A complaint was raised by EPD regarding observations of some spoils was dropped into the sea during the offloading operation at Cheung Sha Wan Pier.	Investigation for the complaint is underway and site inspection at complaint location is arranged on 9 February 2018 for investigation.

10.1.2 The statistical summary of environmental complaint is presented in ***Tables 10-1, 10-2*** and ***10-3***.

Table 10-1 Statistical Summary of Environmental Complaints

Reporting Period	Contract No	Environmental Complaint Statistics			Project related complaint
		Frequency	Cumulative	Complaint Nature	
19 May 2014 – 31 Dec 2017	Contract 2	0	**32**	• **(18)Water Quality** • **(8) Dust** • **(5) Noise** • **(1) dust & noise**	**(6) water quality** **(2) dust** **(1) noise**
06 Nov 2013 – 31 Dec 20177	Contract 3	0	**6**	• **(2) Dust** • **(3) Water quality** • **(1) Noise**	**0**
16 Aug 2013 – 31 Dec 2017	Contract 5	0	**4**	• **(3) Dust** • **(1) Noise**	**0**
16 Aug 2013 – 31 Dec 2017	Contract 6	0	**36**	• **(23) Water Quality** • **(8) Dust** • **(3) Noise** • **(1) Nuisance** • **(1) Noise and dust**	**(7) water quality** **(3) dust** **(1) Nuisance** **(1) Water quality and dust**
15 Feb 2016 – 31 Dec 2017	Contract 7	0	**2**	• **(1) Noise** • **(1) Water quality and dust**	**(1) Water quality and dust**
16 Aug 2013 – 31 Dec 2017	SS C505	0	**3**	• **(1) Noise** • **(1) dust** • **(1) Water quality and dust**	**(1) Water quality and dust**

Reporting Period	Contract No	Environmental Complaint Statistics			Project related complaint
		Frequency	Cumulative	Complaint Nature	
1 – 31 Jan 2018	Contract 2	**1**	**33**	• **(18)Water Quality** • **(8) Dust** • **(5) Noise** • **(1) dust & noise** • **(1) waste management**	NA
	Contract 3	0	**6**	• **(2) Dust** • **(3) Water quality** • **(1) Noise**	NA
	Contract 4	0	0	NA	NA
	Contract 6	0	**36**	• **(23) Water Quality** • **(8) Dust** • **(3) Noise** • **(1) Nuisance** • **(1) Noise and dust**	NA
	Contract 7	0	**2**	• **(1) Noise** • **(1) Water quality and dust**	NA
	SS C505	0	**3**	• **(1) Noise** • **(1) dust** • **(1) Water quality and dust**	NA

Table 10-2 Statistical Summary of Environmental Summons

Reporting Period	Contract No	Environmental Summons Statistics		
		Frequency	Cumulative	Complaint Nature
19 May 2014 – 31 Dec 2017	Contract 2	0	**1**	contravening the Water Pollution Control (General) Regulations
06 Nov 2013 – 31 Dec 20177	Contract 3	0	0	NA
16 Aug 2013 – 31 Dec 2017	Contract 5	0	0	NA
16 Aug 2013 – 31 Dec 2017	Contract 6	0	0	NA
15 Feb 2016 – 31 Dec 2017	Contract 7	0	0	NA
16 Aug 2013 – 31 Dec 2017	SS C505	0	0	NA
1 – 31 Jan 2018	Contract 2	0	**1**	NA
	Contract 3	0	0	NA
	Contract 4	0	0	NA
	Contract 6	0	0	NA
	Contract 7	0	0	NA
	SS C505	0	0	NA

Table 10-3 Statistical Summary of Environmental Prosecutions

Reporting Period	Contract No	Environmental Prosecutions Statistics		
		Frequency	Cumulative	Complaint Nature
19 May 2014 – 31 Dec 2017	Contract 2	0	**1**	contravening the Water Pollution Control (General) Regulations
06 Nov 2013 – 31 Dec 20177	Contract 3	0	0	NA
16 Aug 2013 – 31 Dec 2017	Contract 5	0	0	NA

Reporting Period	Contract No	Environmental Prosecutions Statistics		
		Frequency	Cumulative	Complaint Nature
16 Aug 2013 – 31 Dec 2017	Contract 6	0	0	NA
15 Feb 2016 – 31 Dec 2017	Contract 7	0	0	NA
16 Aug 2013 – 31 Dec 2017	SS C505	0	0	NA
1 – 31 Jan 2018	Contract 2	0	**1**	NA
	Contract 3	0	0	NA
	Contract 4	0	0	NA
	Contract 6	0	0	NA
	Contract 7	0	0	NA
	SS C505	0	0	NA

11 IMPLEMENTATION STATUS OF MITIGATION MEASURES

11.1 GENERAL REQUIREMENTS

11.1.1 The environmental mitigation measures that recommended in the Implementation Schedule for Environmental Mitigation Measures (ISEMM) in the approved EM&A Manual covered the issues of dust, noise, water and waste and they are summarized presented in ***Appendix M.***

11.1.2 All contracts under the Project shall be implementing the required environmental mitigation measures according to the approved EM&A Manual as subject to the site condition. Environmental mitigation measures generally implemented by Contracts 2, 3, 4, 5, 6, 7 and Contract SS C505 in this Reporting Period are summarized in ***Table 11-1***.

Table 11-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Water Quality	• Wastewater to be treated by the wastewater treatment facilities i.e. sedimentation tank or similar facility before discharge.
Air Quality	• Maintain damp / wet surface on access road • Low vehicular speed within the works areas. • All vehicles must use wheel washing facility before off site • Sprayed water during breaking works • A cleaning truck was regularly performed on the public road to prevent fugitive dust emission
Noise	• Restrain operation time of plants from 07:00 to 19:00 on any working day except for Public Holiday and Sunday. • Keep good maintenance of plants • Place noisy plants away from residence or school • Provide noise barriers or hoarding to enclose the noisy plants or works • Shut down the plants when not in used.
Waste and Chemical Management	• On-site sorting prior to disposal • Follow requirements and procedures of the "Trip-ticket System" • Predict required quantity of concrete accurately • Collect the unused fresh concrete at designated locations in the sites for subsequent disposal
General	• The site was generally kept tidy and clean.

11.2 TENTATIVE CONSTRUCTION ACTIVITIES IN THE COMING MONTH

11.2.1 As advised by the ER, the construction works under Contract 5 was substantially completed on 31 August 2016. Construction activities for other Contracts in the coming month are listed below:

Contract 2

Mid-Vent Portal	• Construction of Cut and Cover structure and backfilling • Construction of adit enlargement internal structure • Adit and stud tunnel internal structure and E&M installation • Ventilation building superstructure and internal fitting out • Structure connecting the adit tunnel and ventilation building • Permanent drainage and underground utilities
North Portal	• Construction of retaining wall, permanent drainage, site formation and slip road • Tunnel waterproofing, lining, backfilling and E&M installation • Construction of cross passage and internal structure • TBM North drive excavation North ventilation building superstructure, internal structure and backfilling Drainage cleansing work
South Portal	• Waterproofing and lining activities inside the tunnel • Construction of tunnel cross passage, tunnel backfilling and E&M installation

	• South ventilation building fitting out and E&M installation • Construction of retaining walls and backfilling activities
Admin Building	• Construction of permanent drainage, fence wall and underground utilities • Building internal structure, fitting out and E&M installation

Contract 3

- Cable detection and trial trenches
- Remaining works on new Footbridge
- Noise barrier construction
- Roadworks
- Viaduct Segment erection
- Water main laying works
- Installation of noise barrier steel post & panel
- Parapet Installation on bridge deck
- Drainage Work
- Mini-pile installation works
- Construction of profile barrier & Planter wall on Bridge deck
- Stressing of external tendon
- Waterproofing works in Bridge deck
- Stitching works for longitudinal stitch of viaduct
- Construction of retaining walls and backfill

Contract 4

- System design and testing
- E&M installation at Admin Building
- E&M installation at Ventilation Building
- High mast erection
- E&A installation in tunnel

Contract 6

- Segment section
- Bridge installation
- Tunnel Works
- Sewage Treatment Plant Construction
- Tunnel Ventilation Building Construction
- Slip Road/At-grade Road/Periphery Road Construction

Contract 7

- U-trough and abutment construction at Bridge A and Bridge E
- Column and deck construction at Bridges A and E
- Profile barrier construction at Bridges B and D
- Construction of Façade and BMU at Bridge C
- Construction of R/F floor slab at Bridge C

Contract SS C505

- Building no. 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 16, 17, 18, 21, 22, 23, 24, 25, 27, 28, 30, 31 and 41 constructions
- Tower crane operation
- Bridge 1 - 5 construction works including retaining wall, road and finishes works
- Underground drainage works, Road Works, CLP Cable laying and Landscaping
- Formwork and falsework for PTB's slab construction
- Construction PTB M/F, 1/F, 2/F and Roof flat slab
- Construction PTB non-structural wall, Underground Drainage and Utilities, Fence Wall, Southern Entrance Construction

- PTB backfilling works
- PTB Major Plant Rooms ABWF & MEP Installation, Lift and Escalator Installation by NSC
- Integrated ABWF & MEP Works in PTB, Building no. 1, 2, 3, 4, 5, 6, 7, 18, 36 and 41
- Canopies Construction
- Master Water Meter Room 1, 2 and 3 Construction
- Elevated Walkway E1, E2, E3 and E4 construction
- Tower Crane Dismantling Works

11.3 KEY ISSUES FOR THE COMING MONTH

11.3.1 Key issues to be considered in the coming month for Contracts 2, 3, 4, 6, 7 and SS C505 include:

- Implementation of control measures for rainstorm;
- Regular clearance of stagnant water during wet season;
- Implementation of dust suppression measures at all times;
- Potential wastewater quality impact due to surface runoff;
- Potential fugitive dust quality impact due from the dry/loose/exposure soil surface/dusty material;
- Disposal of empty engine oil containers within site area;
- Ensure dust suppression measures are implemented properly;
- Sediment catch-pits and silt removal facilities should be regularly maintained;
- Management of chemical wastes;
- Discharge of site effluent to the nearby wetland, stockpiling or disposal of materials, and any dredging or construction area at this area are prohibited;
- Follow-up of improvement on general waste management issues; and
- Implementation of construction noise preventative control measures

12 CONCLUSIONS AND RECOMMENDATIONS

12.1 CONCLUSIONS

12.1.1 This is the **54th** monthly EM&A report presenting the monitoring results and inspection findings for the Reporting Period from **1** to **31 January 2018**.

12.1.1 For air quality monitoring, no 1-hour TSP and 24-hour TSP monitoring results triggered the Action or Limit Levels were recorded.

12.1.2 In the Reporting Period, no construction noise measurement results that exceeded the Limit Level were recorded. Moreover, no valid noise complaint which triggered an Action Level exceedance was recorded.

12.1.3 For water quality monitoring, a total of sixteen (16) Action/ Limit Level exceedances, namely eight (8) Limit Level exceedance of turbidity and eight (8) Action/ Limit Level exceedances of Suspended Solids were recorded. Investigation Reports for water quality exceedances were completed which concluded that all the exceedances were related to the impact of rainstorm/ external source of turbid water and not caused by the works under the Project.

ENVIRONMENTAL COMPLAINT

12.1.4 In this Reporting Period, one (1) documented environmental complaint was received regarding the waste management under the EM&A Programme. Investigation for the complaint is underway and site inspection at complaint location is arranged on 9 February 2018 for investigation.

12.1.5 In the Reporting Period, no environmental summons and prosecution under the EM&A Programme was lodged for all Contracts.

12.1.6 During the Reporting Period, weekly joint site inspection by the RE, IEC, ET with the relevant Main-contractor were carried out for Contracts 2, 3, 4, 6 and 7 in accordance with the EM&A Manual stipulation. For Contract SS C505, weekly joint site inspection was carried out by the RE, IEC, ET and main-contractor whereas IEC performed monthly site inspection. No non-compliance observed during the site inspection.

12.2 RECOMMENDATIONS

12.2.1 During dry season, special attention should be paid on the potential construction dust impact since most of the construction sites are adjacent to villages. The Contractor should fully implement the construction dust mitigation measures as appropriately.

12.2.2 Preventive measures for muddy water or other water pollutants from site surface flow to local stream such as Kong Yiu Channel, Ma Wat Channel, Ping Yuen River, Kwan Tei River or public area should be properly maintained. The Contractors should paid special attention on water quality mitigation measures and fully implement according ISEMM of the EM&A Manual, in particular for working areas near Ma Wat Channel and Ping Yuen River.

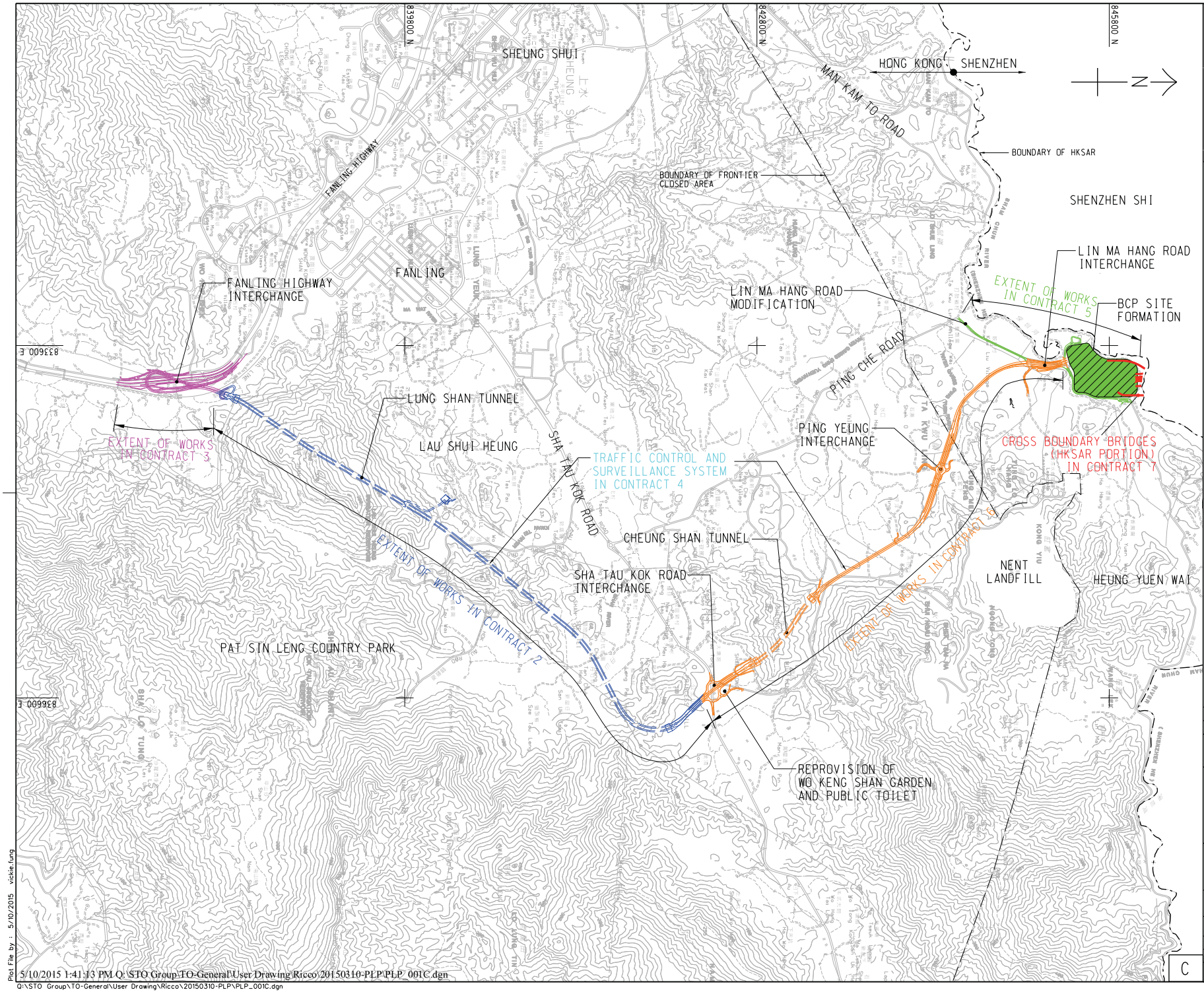
12.2.3 In addition, all effluent discharge shall be ensure to fulfill Technical Memorandum of Effluent Discharged into Drainage and Sewerage Systems, inland and Coastal Waters criteria or discharge permits stipulation.

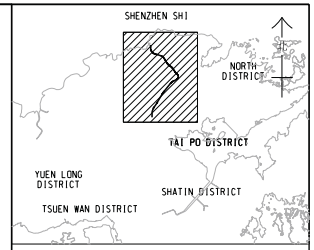
12.2.4 Construction noise would be a key environmental issue during construction work of the Project. Noise mitigation measures such as using quiet plants should be implemented in accordance with the EM&A requirement.

12.2.5 Furthermore, daily cleaning and weekly tidiness shall be properly performed and maintained. In addition, mosquito control should be kept to prevent mosquito breeding on site.

Appendix A

Layout plan of the Project





LOCATION PLAN
SCALE 1 : 30000

LEGEND:

UNDERGROUND WORKS

REV. 修訂	DESCRIPTION 內容摘要	D.E.	P.E. CHECKED 審核	DATE 日期

土木工程拓展署
Civil Engineering and Development Department

LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS (SITE FORMATION AND INFRASTRUCTURES) - DESIGN AND CONSTRUCTION

PROJECT LAYOUT PLAN

AECOM

DRG.NO. 圖紙編號 60212563/PLP/001

DESIGNED BY 設計	-	CONTRACT NO. 合約編號	-	P. DIV. APPROVED 批准人	-
DRAWN BY 繪圖	ZJ	STATUS 階段			
SCALE 比例	A1 1 : 15000 A3 1 : 30000				
DIMENSIONS ARE IN 尺寸單位	METRES	© COPYRIGHT RESERVED 版權所有			

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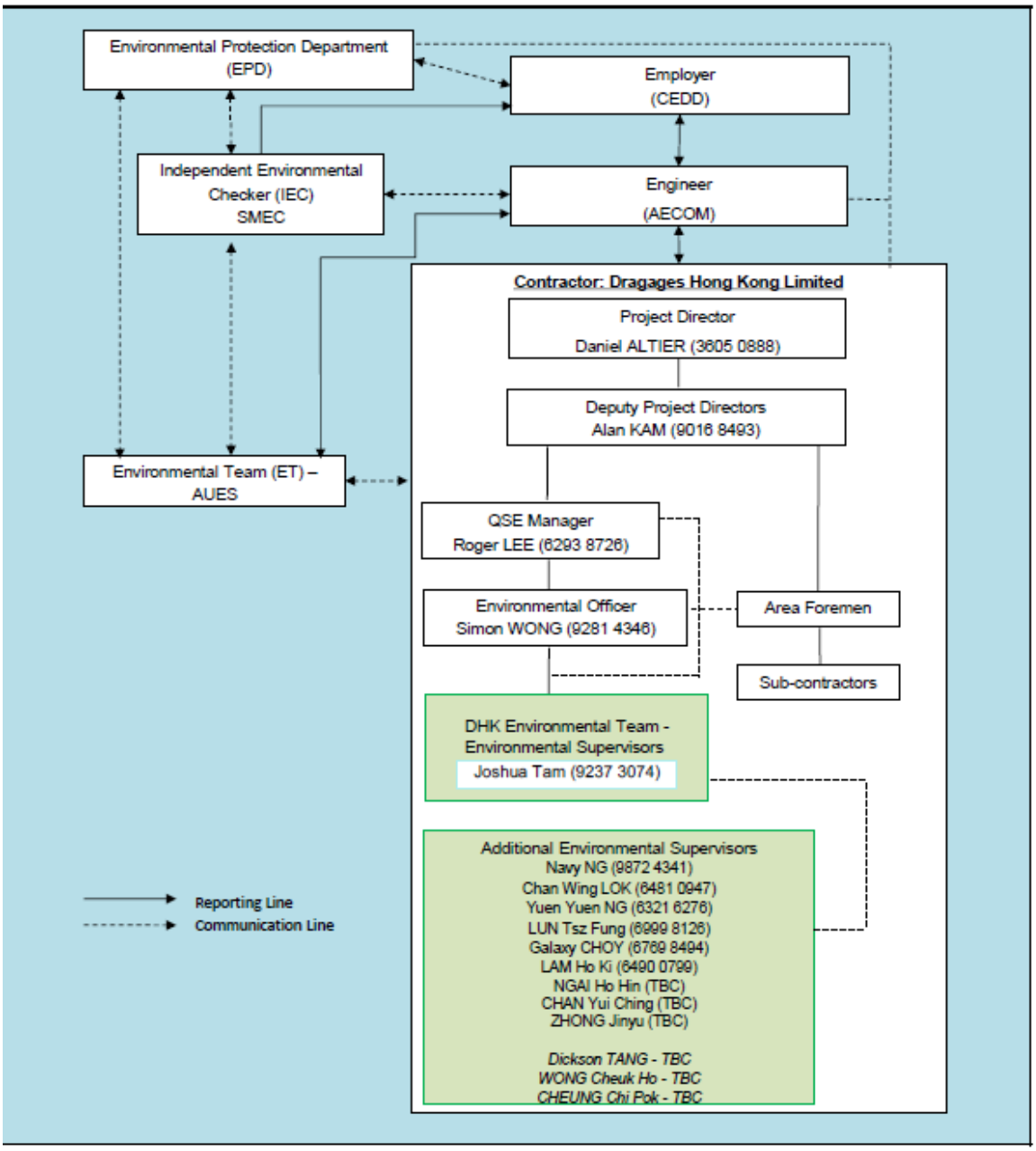
Appendix B

Organization Chart



Environmental Management Organization for Contract 2 - (CV/2012/08)

Contact Details of Key Personnel for Contract 2 - CV/2012/08

Organization	Project Role	Name of Key Staff	Tel No	Fax No.
AECOM	Engineer's Representative	Edwin Ching	2171 3301	2171 3498
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
DHK	Project Director	Daniel Altier	3605 0888	2171 3299
DHK	Deputy Project Manager	Alan Kam	9016 8493	2171 3299
DHK	QSE Manager	Roger Lee	6293 8726	2171 3299
DHK	Environmental Officer	Simon Wong	2171 3017	2171 3299
DHK	Environmental Supervisor	Joshua Tam	9237 3074	2171 3299
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

Legend:

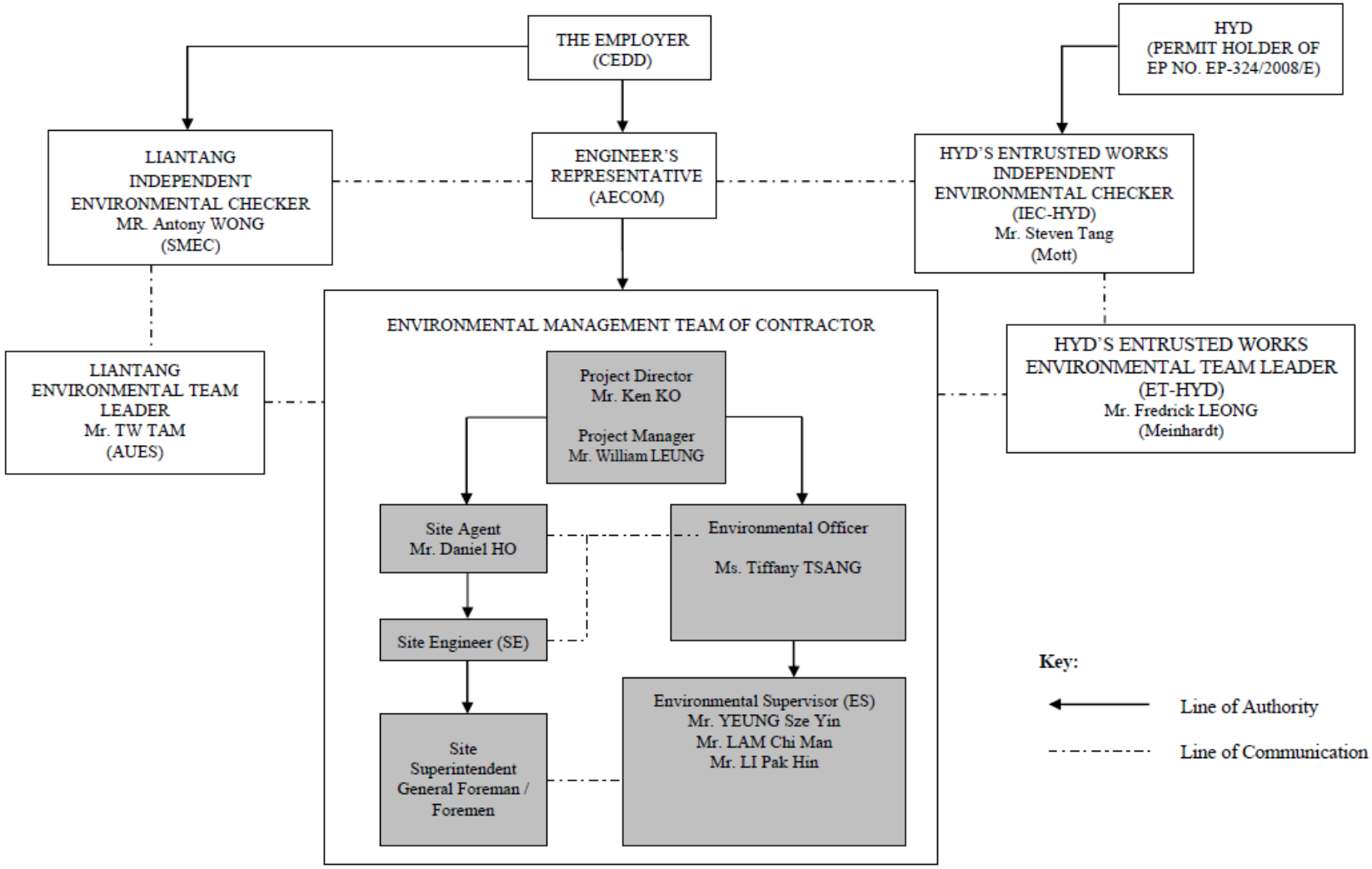
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

DHK(Main Contractor) –Dragages Hong Kong Ltd.

SMEC (IEC) – SMEC Asia Limited

AUES (ET) – Action-United Environmental Services & Consulting



Environmental Management Organization for Contract 3 - CV/2012/09

Contact Details of Key Personnel for Contract 3 - CV/2012/09

Organization	Project Role	Name of Key Staff	Tel No	Fax No.
AECOM	Engineer's Representative	Alan Lee	2171 3303	2171 3498
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
Chun Wo	Project Director	Ken Ko	3758 8735	2638 7077
Chun Wo	Project Manager	William Leung	2638 6136	2638 7077
Chun Wo	Site Agent	Daniel Ho	2638 6144	2638 7077
Chun Wo	Environmental Officer	Tiffany Tsang	2638 6151	2638 7077
Chun Wo	Environmental supervisor	Li Pak Hin	2638 6125	2638 7077
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

Legend:

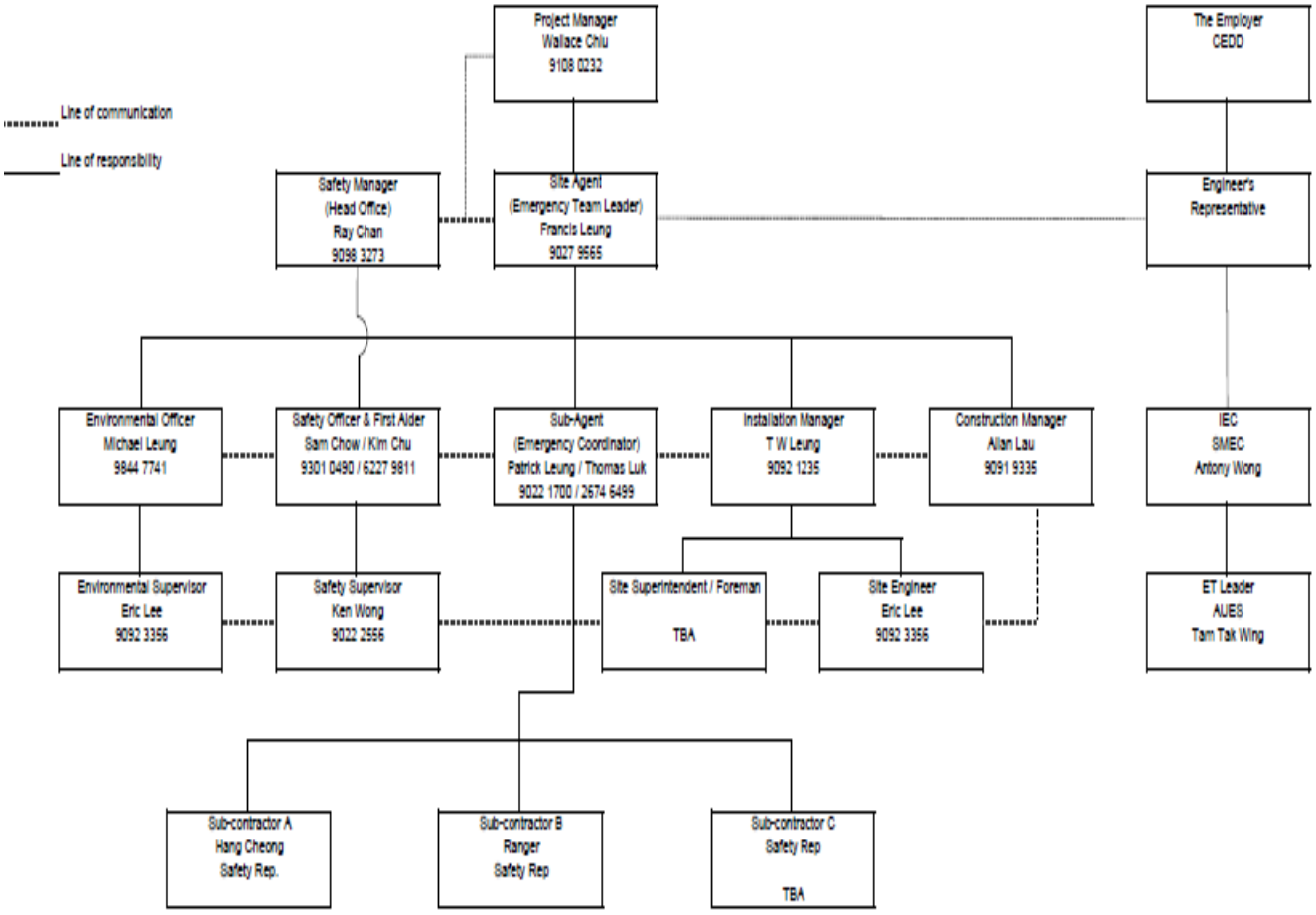
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

Chun Wo (Main Contractor) – Chun Wo Construction Ltd.

SMEC (IEC) – SMEC Asia Limited

AUES (ET) – Action-United Environmental Services & Consulting



Environmental Management Organization for Contract 4 - NE/2014/02

Contact Details of Key Personnel for Contract 4 - NE/2014/02

Organization	Project Role	Name of Key Staff	Tel No	Fax No.
AECOM	Engineer's Representative	Leo Lai	2171 3310	2171 3498
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
Siemens	Project Manager	Wallace Chiu	9108 0232	--
Siemens	Site Agent	Francis Leung	9027 9565	--
Siemens	Environmental Officer	Michael Leung	9844 7741	--
Siemens	Environmental Supervisors	Eric Lee	9092 3356	--
AUES	Environmental Team Leader	T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079

Legend:

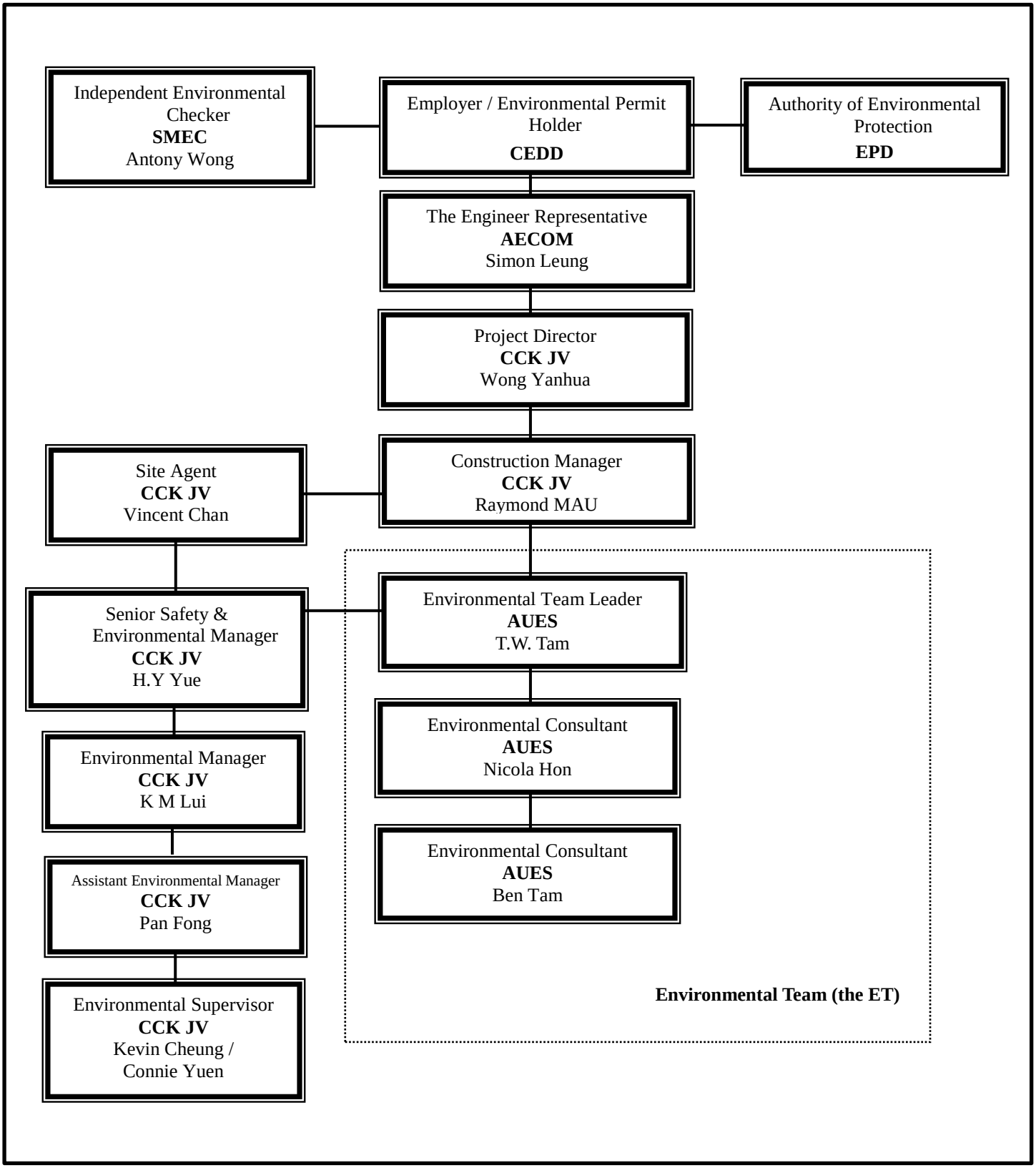
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

Siemens (Main Contractor) – Siemens Ltd.

SMEC (IEC) – SMEC Asia Limited

AUES (ET) – Action-United Environmental Services & Consulting



Environmental Management Organization – CV/2013/08

Contact Details of Key Personnel for Contract 6 - CV/2013/08

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
AECOM	Engineer's Representative	Simon Leung	2251 0688	2251 0698
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
CCK JV	Project Director	Wang Yanhua	6190 4212	--
CCK JV	Construction Manager	Raymond Mau Sai-Wai	9011 5340	--
CCK JV	Site Agent	Vincent Chan	9655 9404	--
CCK JV	Senior Safety & Environmental Manager	H.Y. Yue	9185 8186	--
CCK JV	Environmental Manager	K M Lui	51138223	--
CCK JV	Assistant Environmental Manager	Pan Fong	9436 9432	--
CCK JV	Environmental Supervisor	Kevin Cheung/ Connie Yuen	6316 6931 6117 1344	--
AUES	Environmental Team Leader	TW Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079

Legend:

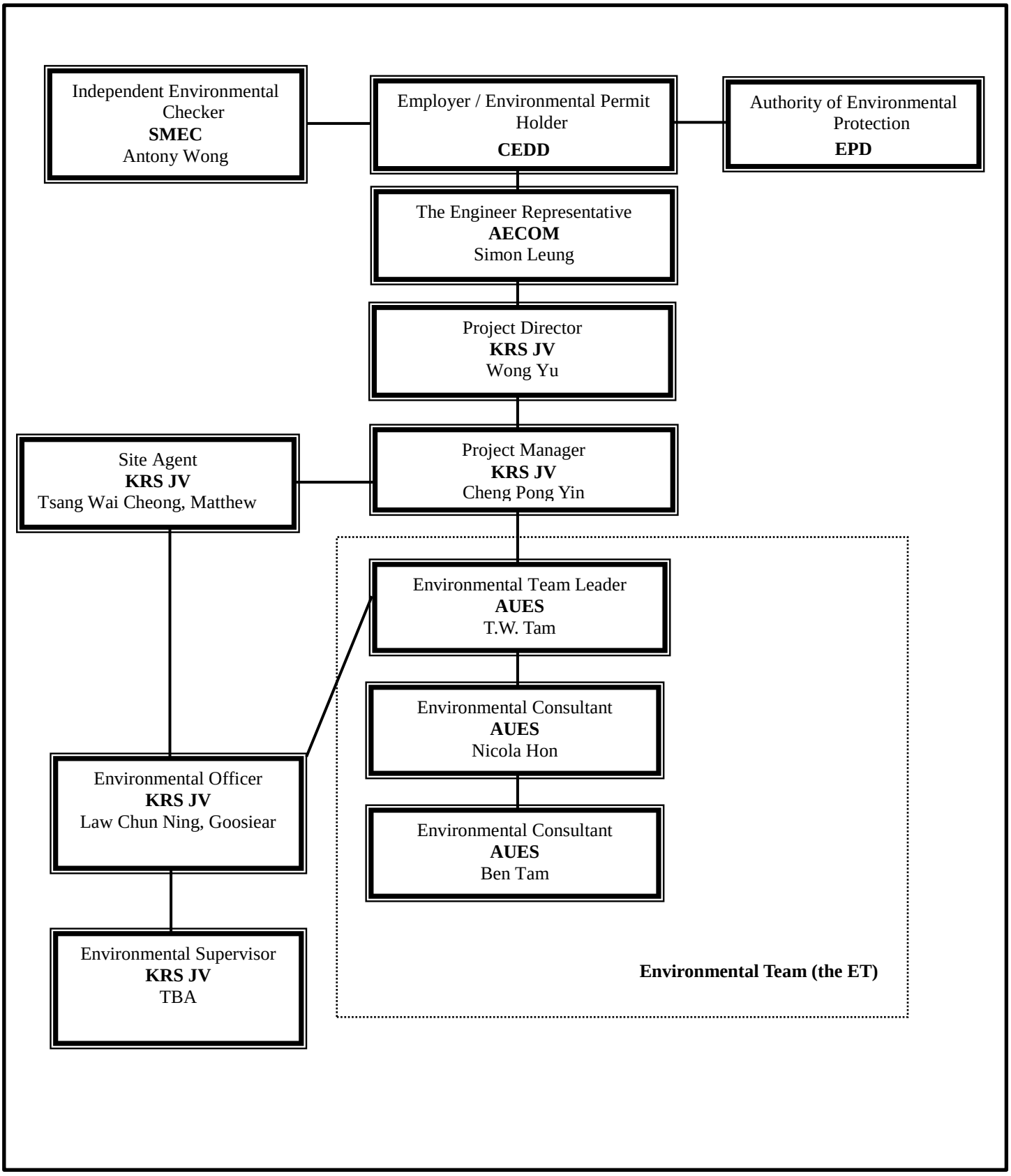
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

CCK JV (Main Contractor) – CRBE-CEC-Kaden Joint Venture

SMEC (IEC) – SMEC Asia Limited

AUES (ET) – Action-United Environmental Services & Consulting



Environmental Management Organization –NE/2014/03

Contact Details of Key Personnel for Contract 7 – NE/2014/03

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
AECOM	Engineer's Representative	Kelvin lee	2251 0609	2251 0698
SMEC	Independent Environmental Checker	Antony Wong	3995 8120	3995 8101
KRSJV	Project Director	Wong Yu	2682 6691	2682 2783
KRSJV	Project Manager	Cheng Pong Yin	9023 4821	2682 2783
KRSJV	Site Agent	Tsang Wai Cheong, Matthew	9705 7536	2682 2783
KRSJV	Environmental Officer	Law Chun Ning, Goosiear	9625 2381	2682 2783
KRSJV	Environmental Supervisor	TBA	6592 3084	2682 2783
AUES	Environmental Team Leader	TW Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ben Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Nicola Hon	2959 6059	2959 6079

Legend:

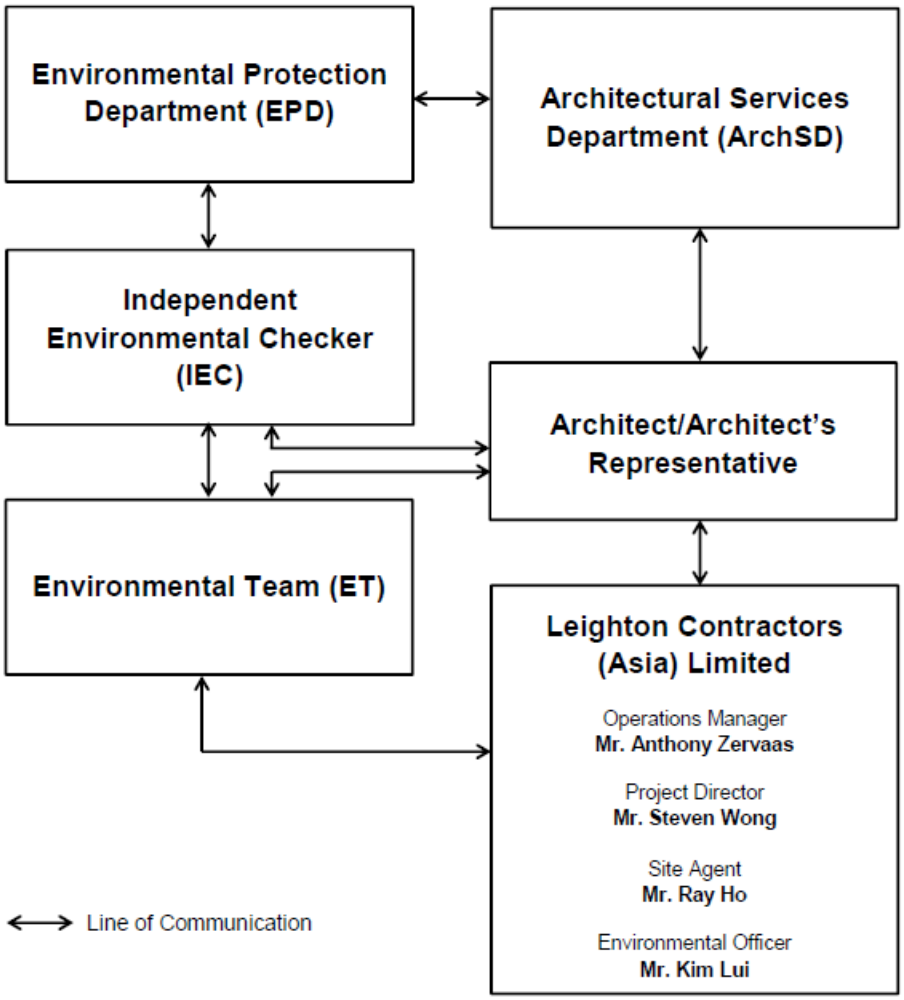
CEDD (Employer) – Civil Engineering and Development Department

AECOM (Engineer) – AECOM Asia Co. Ltd.

KRS JV (Main Contractor) –Kwan On-Richwell-SCG Joint Venture

SMEC (IEC) – SMEC Asia Limited

AUES (ET) – Action-United Environmental Services & Consulting



Environmental Management Organigram

Environmental Management Organization for Contract SS C505

Contact Details of Key Personnel for Contract SS C505

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
ArchSD	Works agent for the Development Bureau (DEVB)	Mr. William Cheng	2867 3904	2804 6805
Ronald Lu & Partners	Architect/ Architect's Representative	Mr. Justin Cheung	3189 9272	2834 5442
SMEC	Independent Environmental Checker	Mr. Antony Wong	3995 8120	3995 8101
Leighton	Operation Manager	Mr. Antony Zervaas	2823 1433	2529 8784
Leighton	Project Director	Mr. Steven Wong	2858 1519	2858 1899
Leighton	Site Agent	Mr. Ray Ho	2858 1519	2858 1899
Leighton	Environmental Officer	Mr. Kim Lui	3973 1003	-
Leighton	Assistant Environmental Officer	Ms. Penny Yiu	3973 0818	-
AUES	Environmental Team Leader	Mr. T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959 6059	2959 6079
AUES	Environmental Consultant	Mr. Ben Tam	2959 6059	2959 6079

Legend:

ArchSD (Project Proponent) –Architectural Services Department

Ronald Lu & Partners (Architect/ Architect's Representative) –Ronald Lu & Partners (Hong Kong) Ltd

Leighton (Main Contractor) – Leighton Contractors (Asia) Limited

SMEC (IEC) – SMEC Asia Limited

AUES (ET) – Action-United Environmental Services & Consulting

Appendix C

3-month rolling construction program

Contract 2

Liantang / Heung Yuen Wai Boundary Control Point and Associated Works
CEDD Contract No: CV/2012/08
Main Contractor: Dragages Hong Kong Ltd

Tentative Three Months (January 2018, February 2018 and March 2018) Construction Rolling Progam

Item	Construction Activites
1	Admin Bldg - Construction of permanent drainage, fence wall and underground utilities
2	Admin Bldg - Building internal structure, fitting out and E&M installation
3	Mid Vent Portal - Construction of Cut and Cover structure and backfilling activities
4	Mid Vent Portal - Construction of adit enlargement internal structure
5	Mid Vent Portal - Adit and stud tunnel internal structure and E&M installation
6	Mid-Vent Portal - Ventilation building superstructure, internal fitting out and E&M installation
7	Mid Vent Portal - Structure connecting adit tunnel and ventilation building
8	Mid-Vent Portal - Permanent drainage & underground utilities
9	North Portal - Construction of retaining wall, permanent drainage, site formation and slip road
10	North Portal - Tunnel waterproofing, lining, backfilling and E&M installation
11	North Portal - Construction of tunnel cross passage and internal structure
12	North Portal - TBM North drive excavation
13	North Portal - North ventilation building superstructure, internal structure and backfilling
14	North Portal - Dismantling of tower crane no.2
15	South Portal - Waterproofing and lining activities inside the tunnle.
16	Sorth Portal - Construction of tunnel cross passage, tunnel backfilling and E&M installation
17	South Portal - South ventilation building internal fitting out and E&M installation
18	South Portal - Construction of retaining walls and backfilling activities

Contract 3

Liantang / Heung Yuen Wai Boundary Control Point and Associated Works
CEDD Contract No: CV/2012/09
Main Contractor: Chun Wo Construction Ltd

俊和建築工程有限公司
CHUN WO CONSTRUCTION & ENGINEERING CO., LTD.

Tentative Three Months (January, February and March 2018) Construction Rolling Progam

Item	Construction Activites
1	Cable detection and trial trenches
2	Remaining works on new Footbridge
3	Noise barrier construction
4	Roadworks
5	Viaduct segment erection
6	Water main laying works
7	Installation of Noise barrier steel column & panel
8	Parapet Installation on bridge deck
9	Drainage Work
10	Mini-pile installation
11	Construction of profile barrier & Planter wall on Bridge deck
12	Stressing of external tendon
13	Waterproofing works on Bridge deck
14	Stitching works for longitudinal stitch of viaduct
15	Construction of retaining walls and backfill

Contract 4

Liantang / Heung Yuen Wai Boundary Control Point and Associated Works
CEDD Contract No: NE/2014/02
Main Contractor: Siemens Ltd.

SIEMENS
Ingenuity for life

Tentative Three Months (January, February and March 2018) Construction Rolling Progam

Item	Construction Activites
1	System design and testing
2	E&M installation at admin building
3	E&M installation at Ventilation Building
4	E&A installation in tunnel
5	High mast erection

Contract 6

Liantang / Heung Yuen Wai Boundary Control Point and Associated Works
CEDD Contract No: CV/2013/08
Main Contractor: CRBE-CEC-Kaden Joint Venture

CRBC-CEC-KADEN Joint Venture

Tentative Three Months (January, February and March 2018) Construction Rolling Progam

Item	Construction Activites
1	Segment Erection
2	Bridge Installation
3	Tunneling Works
4	Sewage Treatment Plant Construction
5	Tunnel Ventilation Building Construction
6	Slip Road/At-grade Road/Periphery Road Construction

Contract 7

Liantang / Heung Yuen Wai Boundary Control Point and Associated Works
CEDD Contract No: NE/2014/03
Main Contractor: Kwan On-Richwell-SCG Joint Venture

均安 - 顯豐機械 - 上海建工 聯營
Kwan On - Richwell - SCG JV

Tentative Three Months (January, February and March 2018) Construction Rolling Progam

Item	Construction Activites
1	U-tough and abutment construction at Bridges A and E
2	Column and construction at Bridges A and E
3	Profile barrier construction at Bridges B and D
4	Construction of Façade and BMU at Bridge C
5	Construction of R/F floor slab and staircase at Bridge C

Contract SS C505

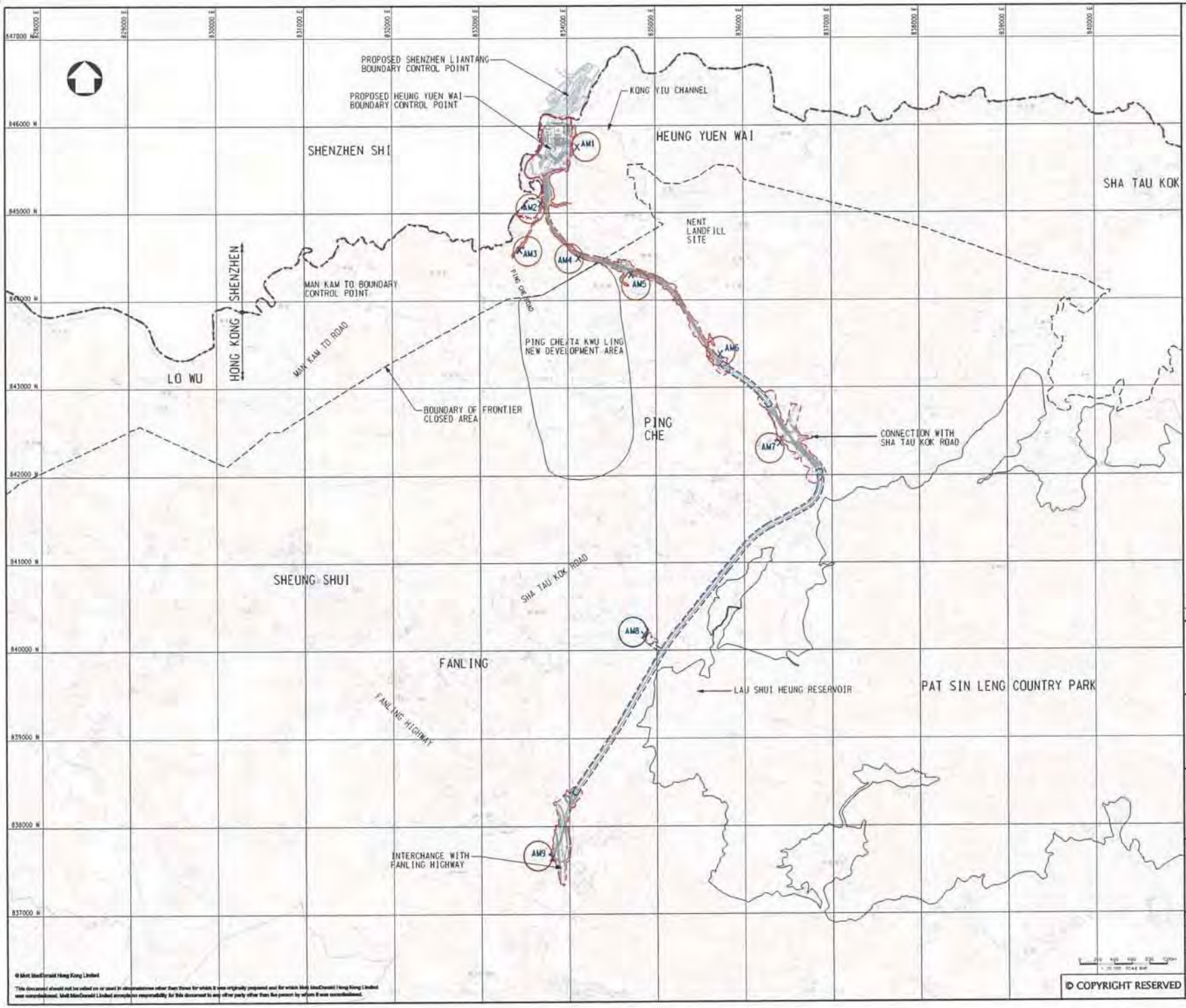
Liantang / Heung Yuen Wai Boundary Control Point and Associated Works
ArchSD Contract No: SSC505
Main Contractor: Leighton

Tentative Three Months (January, February and March 2018) Construction Rolling Progam

Item	Construction Activites
1	Passenger Terminal Building - Structure Works, Backfiling & Drainage, Under Ground Utilities, Fence Wall and Slab Construction
2	Passenger Terminal Building - ABWF Works & Integrated MEP Installation, Nonstructure Wall Erection and Southern Entrance Construction
3	Passenger Terminal Building - Major Plant Rooms ABWF Works & MEP Installation, and Lift & Escalator Installation by NSC
4	PTB Roof & Upper Roof Roofting Works - Outstanding Structure Works and Concrete Repairing
5	PTB - Coach & Private Car Kiosks (Inbound) - Structures Works
6	PTB - Private Car Examination Buildings and MXRVSS (Inbound) - Structures and Steel Structures Works
7	C&ED Detector Dog Base - External Structure Works and Integrated ABWF & MEP Works
8	HKPF Building and Observation Tower - Structures, External Works, Integrated ABWF & MEP Works
9	Fire Station and Drill Tower - Structures, External Works, Integradted ABWF & MEP Works
10	Cargo Examination Building (Inbound) - Structure, Steel Structure Works and Integrated ABWF & MEP Works
11	Cargo Examination Building (Outbound) - Structure, Steel Strucure Works and Integrated ABWF & MEP Works
12	Fixed X-ray Vehicle Inspection System (FXRVIS) Buildings (Inbound) - Structures, External Works and Integrated ABWF & MEP Works
13	Fixed X-ray Vehicle Inspection System (FXRVIS) Buildings (Outbound) - Structures, External Works and Integrated ABWF & MEP Works
14	MXRVSS (Inbound) - Structure Works
15	GV Kiosk (Inbound) - Substructures and Superstructures Works
16	GV Kiosk (Outbound) - Earthworks and Substructures Works
17	Public Toilets (Inbound) - Structure Works
18	Public Toilets (Outbound) - Structures Works
19	Disinsection Facilities (Inbound) - Substructure and Structure Works
20	Weigh Station - Substructure and Structure Works
21	EUVSS & Monitoring Room - Substructure and Superstructure Works
22	Refuse Collection Point - Structures, Integrated ABWF and MEP Works
23	Traffic Control Office (Inbound) - Structure Works
24	Inspection Post - Structure Works
25	Guard Booth (Inbound) - Structure Works
26	Guard Booth (Outbound) - Structure Works
27	Steel Canopies - Construction of Footings and Tie Beam, Erection of Steel Columns
28	Fire Hydrant Tank & Pump Room - Integrated ABWF and MEP Works
29	Irrigation Pump Room - Structures works and Integrated ABWF & MEP Works
30	Master Water Meter Room 1,2,3 - Structures Works and Integrated ABWF and MEP Works
31	Elevated Walkway (E1, E2, E3 & E4) - Structures and Structural Steel Works
32	Vehicular bridges 1-5 - Retaining walls, Road and Finishes Works
33	External Works - CLP Cable & Power ON Transfer room
34	External Works - Water Meter Room Connection (Inbound)
35	External Works - Underground Utilities, Structures and Inspection (Inbound & Outbound Areas)
36	Tower Crane Dismantling Works

Appendix D

Designated Monitoring Locations as Recommended in the Approved EM&A Manual



Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	AUG 10	MENG	FIRST ISSUE	DC	HT

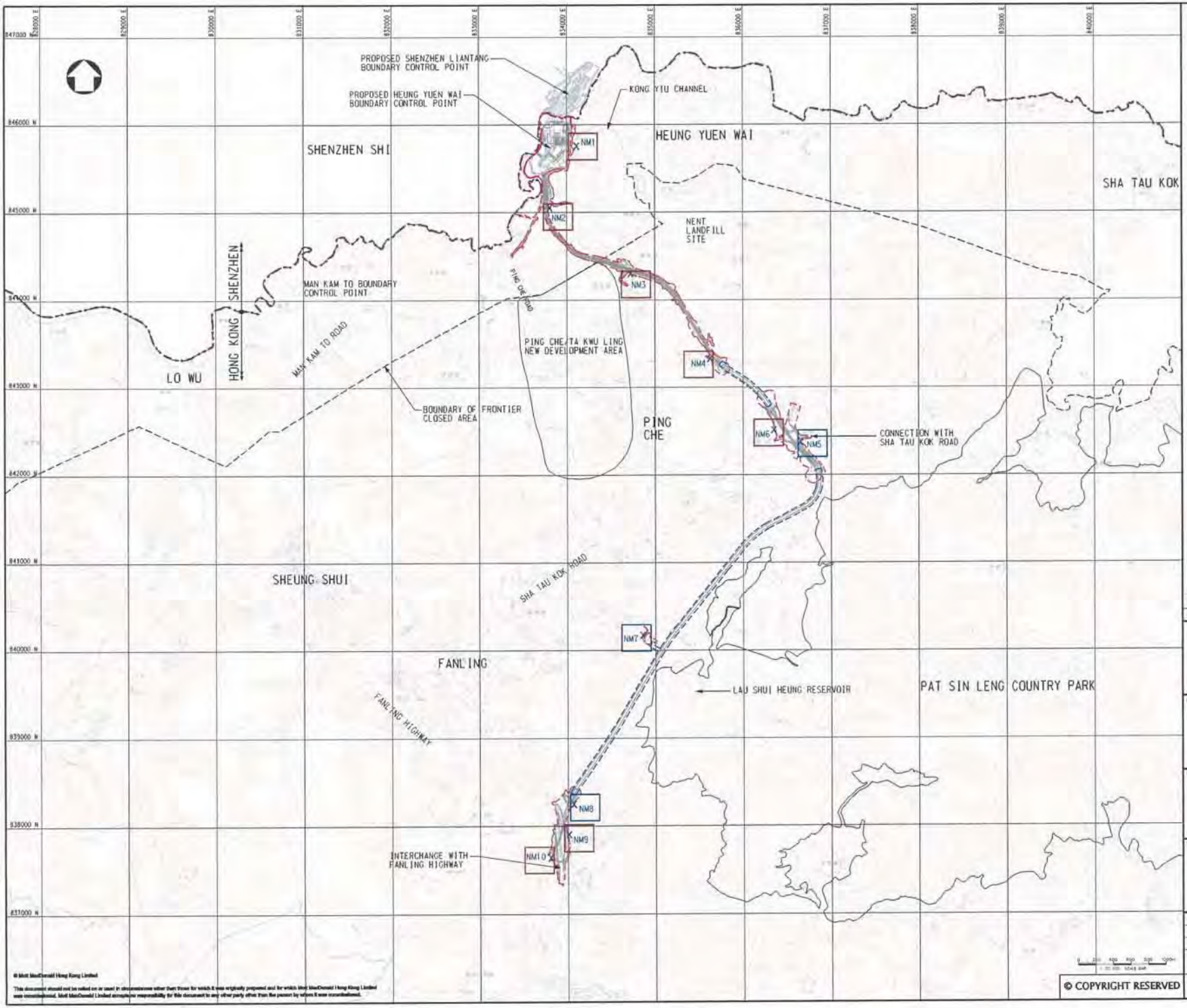
Mott MacDonald

Client: CEDD — CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project: AGREEMENT NO. CE45/2008(CE) LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title: PROPOSED LOCATION OF CONSTRUCTION AIR QUALITY MONITORING STATIONS

Designed	DC		Eng.Chk.	EC	
Drawn	MENG		Coordination	EC	
Eng.Chk.	DC		Approved	HT	
Scale at A1	1:20000	Project	255228		Status PRE
Drawing No	FIGURE 2.1				Rev P1



LEGEND:

- BOUNDARY OF HKSAR
- WORKS AREA (ABOVE GROUND)
- WORKS AREA (TUNNEL)
- X CONSTRUCTION NOISE MONITORING STATIONS

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	AUG 10	MING	FIRST ISSUE	DC	HT

Mott MacDonald

Client: CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project: AGREEMENT NO. CE45/2008(CE) LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title: PROPOSED LOCATION OF CONSTRUCTION NOISE MONITORING STATIONS

Designed	DC		Eng.Chk.	EC	
Drawn	MING		Coordination	EC	
Dwg.Chk.	DC		Approved	HT	
Scale at A1	1:20000	Project	255228		Status PRE
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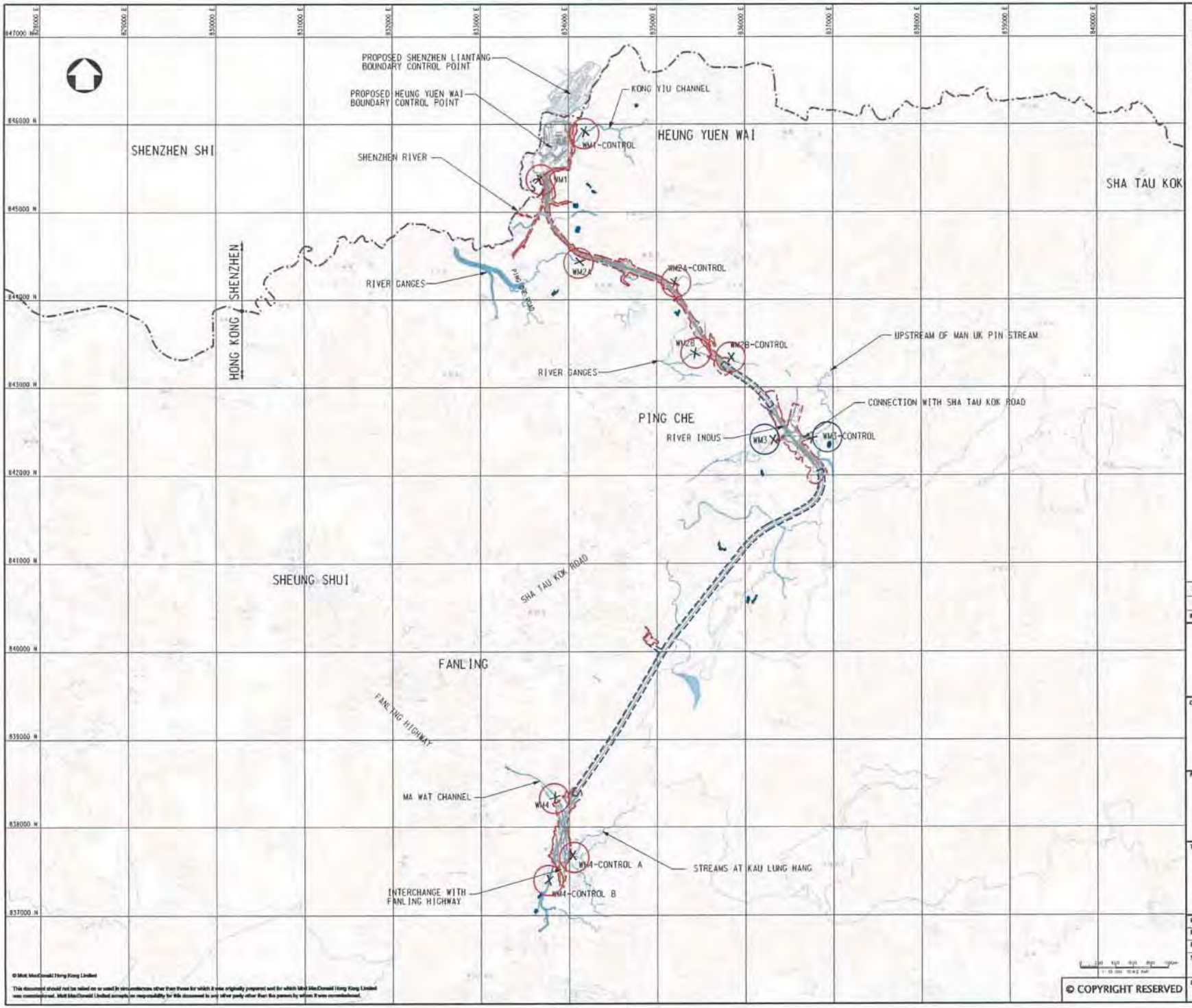


LEGEND:

- BOUNDARY OF HKSAR
- LAND REQUIREMENT LIMIT (ABOVE GROUND)
- LAND REQUIREMENT LIMIT (TUNNEL)
- X PROPOSED WATER QUALITY MONITORING STATION

MONITORING STATION	CO-ORDINATES	
	EASTING(m)	NORTHING(m)
WM1	833668.635	845371.097
WM1-CONTROL	834185.480	845916.662
WM2A	834132.193	844432.910
WM2A-CONTROL	835205.329	844200.151
WM2B	835434.744	843394.606
WM2B-CONTROL	835845.878	843343.625
WM3	836323.622	842404.977
WM3-CONTROL	836763.419	842425.507
WM4	833840.783	838344.842
WM4-CONTROL A	834038.937	837688.995
WM4-CONTROL B	833769.123	837406.936

Rev	Date	Drawn	Description	Ch'k'd	App'd
P2	NOV 10	WING	GENERAL REVISION	HC	HT
P1	OCT 10	WING	FIRST ISSUE	HC	HT

Mott MacDonald

Client

CEDD CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project

AGREEMENT NO. CE45/2008(CE)
LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

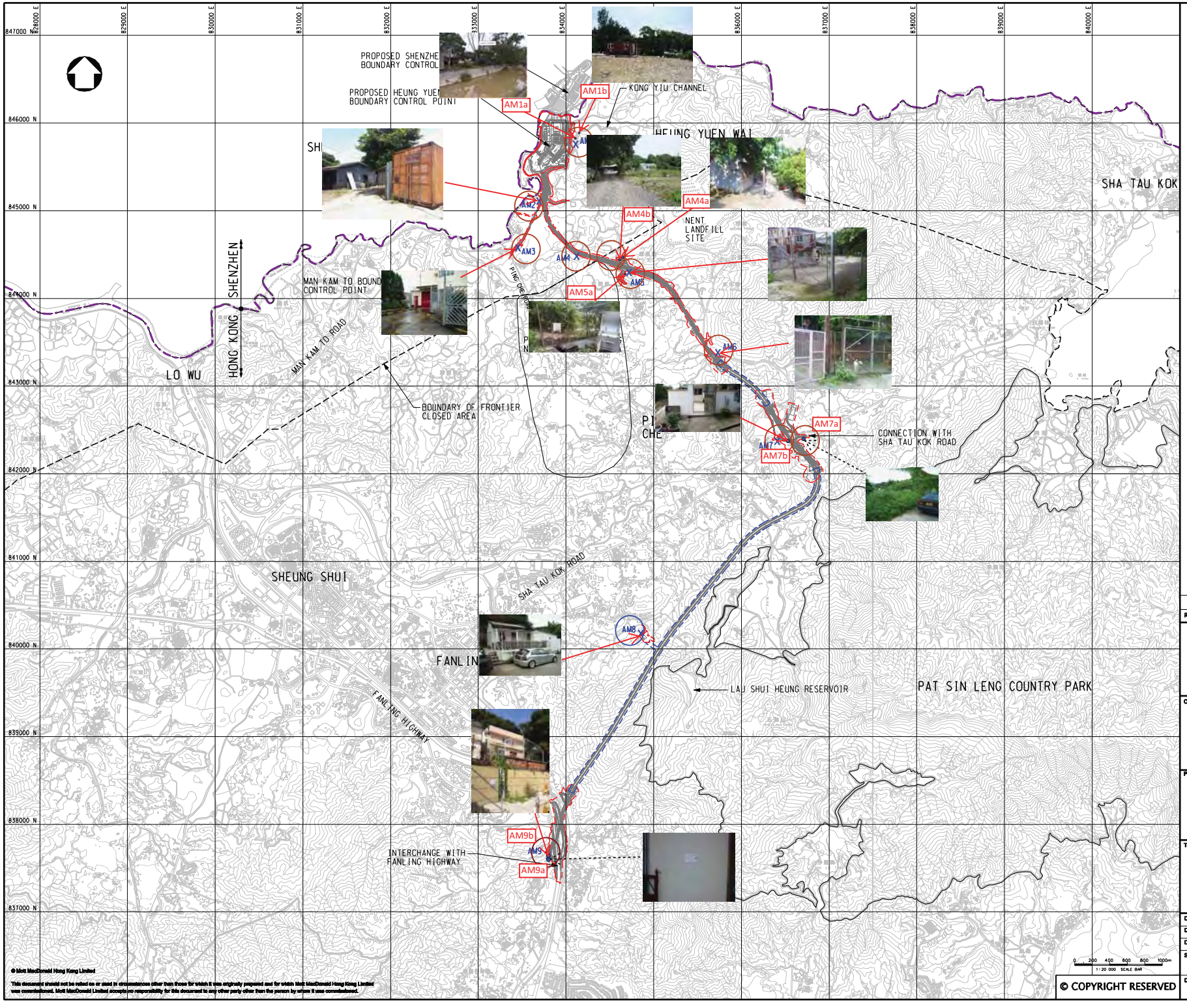
Title

LOCATIONS OF PROPOSED WATER QUALITY MONITORING STATIONS

Designed	HC		Eng.Chk.	EC	
Drawn	WING		Coordination	EC	
Eng.Chk.	HC		Approved	HT	
Scale at A1	1:20000	Project	255228		Status PRE
Drawing No	FIGURE 4.1				Rev P2

Appendix E

Monitoring Locations for Impact Monitoring



LEGEND:

- BOUNDARY OF HKSAR
- WORKS AREA (ABOVE GROUND)
- WORKS AREA (TUNNEL)
- X Air Monitoring Stations in the EM&A Manual
- Proposed Air Monitoring Stations

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	AUG 10	MING	FIRST ISSUE	DC	HT

Mott MacDonald
20/F Two Landmark East
100 How Ming Street
Kwun Tong, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

CEDD
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project

AGREEMENT NO. CE45/2008(CE)
LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title

PROPOSED LOCATION OF CONSTRUCTION AIR QUALITY MONITORING STATIONS

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Dwg.Chk.	DC		Approved	HT	
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Drawing No	FIGURE 2.1			Rev	P1

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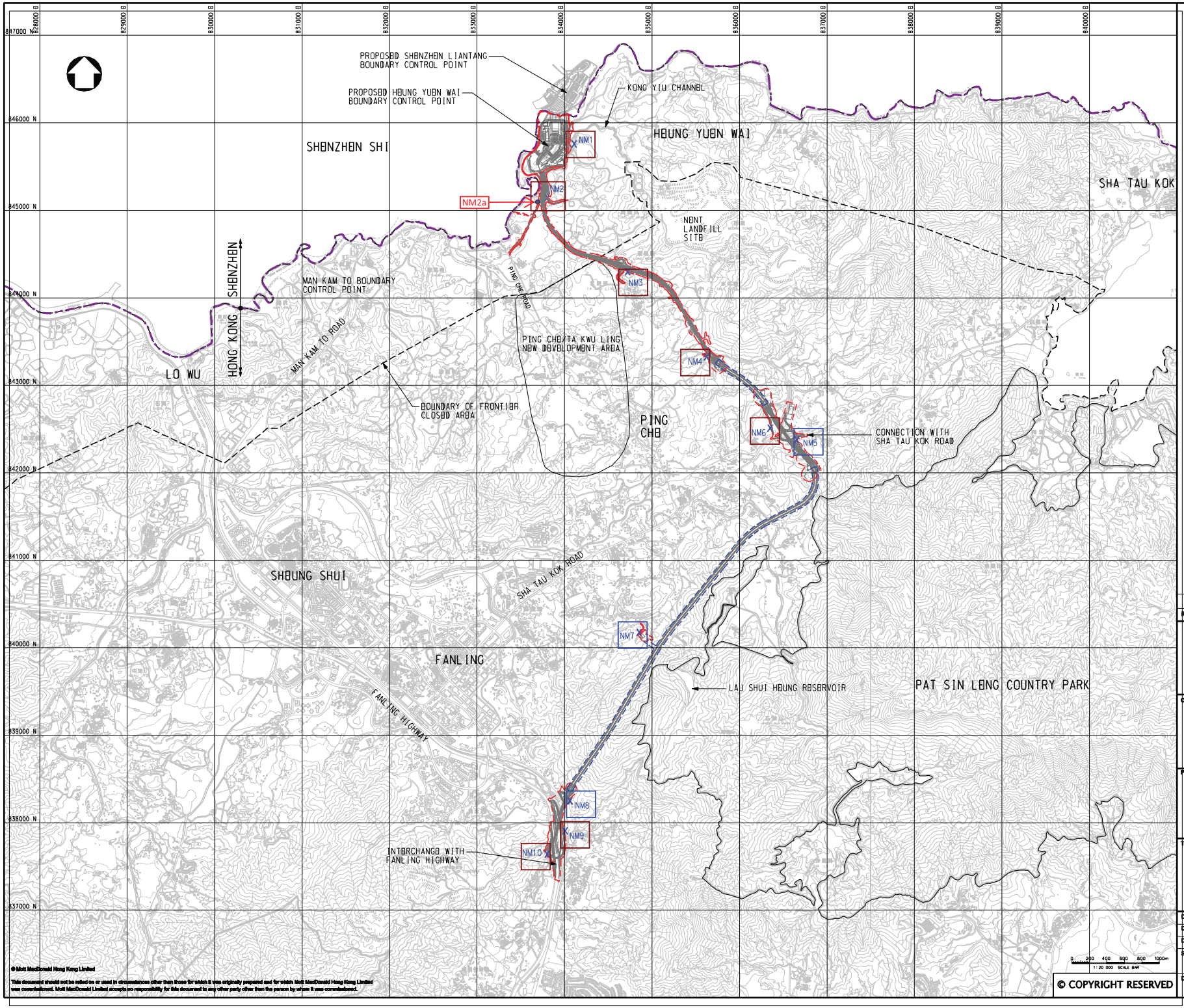

LEGEND:

- BOUNDARY OF HKSAR
- WORKS AREA (ABOVE GROUND)
- WORKS AREA (TUNNEL)
- X CONSTRUCTION NOISE MONITORING STATIONS
- Proposed Noise Monitoring Stations

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	AUG 10	MING	FIRST ISSUE	DC	HT

Mott MacDonald
20/F Two Landmark East
100 How Ming Street
Kwun Tong, Kowloon
Hong Kong
T +852 2828 5757
F +852 2827 1823
W www.mottmac.com.hk

Client

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project

AGREEMENT NO. CE45/2008(CE)
LIANTANG/HUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title

PROPOSED LOCATION OF CONSTRUCTION NOISE MONITORING STATIONS

Designed	DC		Eng.Chk.	BC	
Drawn	MING		Coordination	BC	
Dwg.Chk.	DC		Approved	HT	
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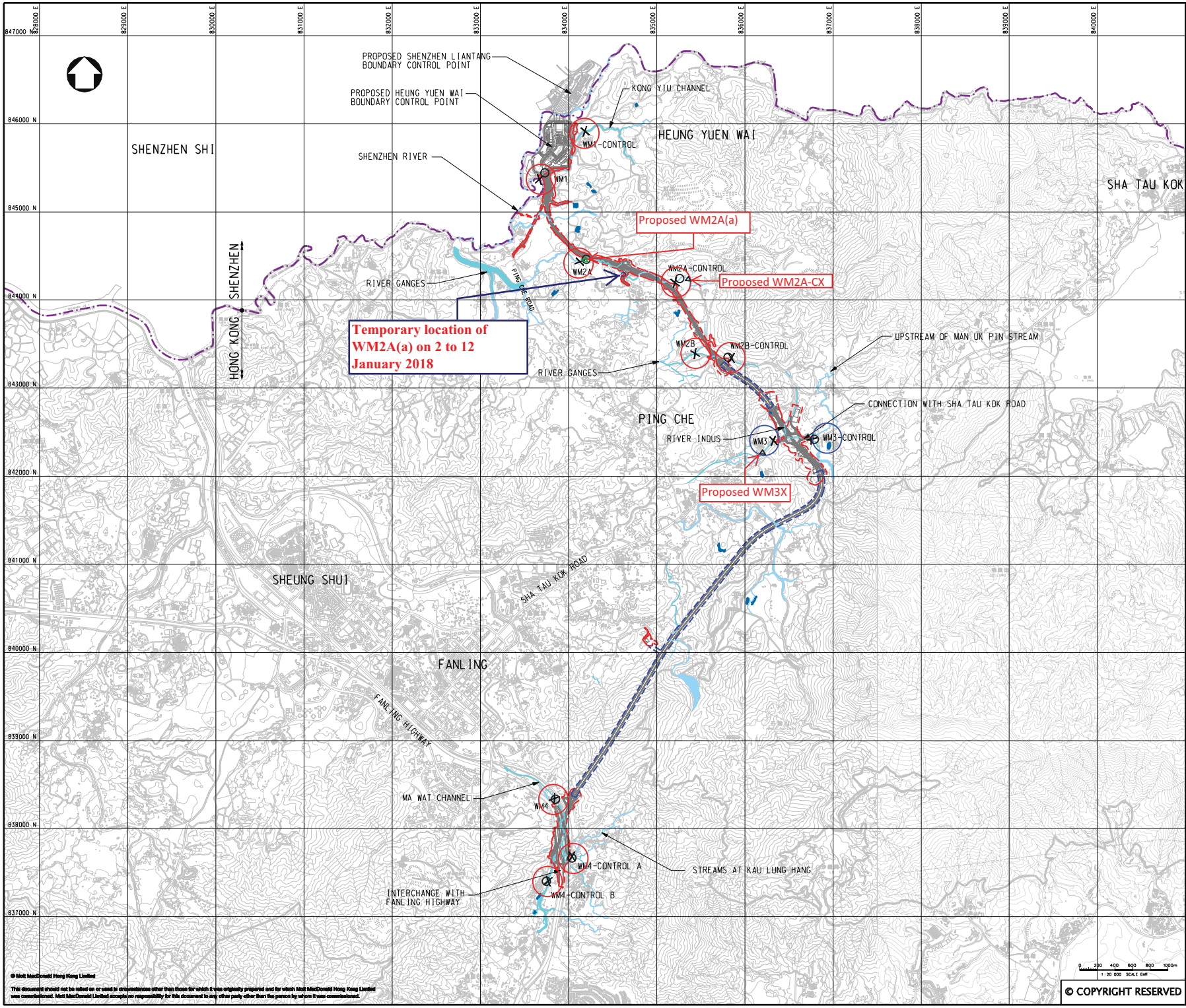

LEGEND:

- BOUNDARY OF HKSAR
- LAND REQUIREMENT LIMIT (ABOVE GROUND)
- LAND REQUIREMENT LIMIT (TUNNEL)
- X — Water Quality Monitoring Location Recommended in EM&A Manual
- ○ — Alternative Water Quality Monitoring Location for EM&A Programme
- △ — New Proposed Water Quality Monitoring Location in November 2015
- △ — New Proposed Water Quality Monitoring Location in May 2016

Station ID	Location recommended in EM&A Manual Coordinates Easting	Northing	Location found during site visit Coordinates Easting	Northing
WM1	833668.835	845371.897	833679	845421
WM1 Control	834181.480	845916.662	834185	845917
WM2A	834182.193	844432.910	834204	844471
WM2A-Control	835205.329	844200.151	835270	844243
WM2B	835434.744	843304.606	835435	843397
WM2B-Control	835845.878	843343.625	835835	843351
WM3	836323.622	842404.377	836324	842407
WM3-Control	836763.419	842425.507	836763	842400
WM4	833840.784	838344.842	833850	838338
WM4-Control A	834058.937	837668.985	834028	837695
WM4-Control B	833769.123	837406.936	833760	837395

New Proposed Water Quality Monitoring Location in November 2015		
Location ID	Easting	Northing
WM2A-C (Original)	0835270	0844243
WM2A-Cx (Proposed)	0835377	0844188
WM3(Original)	0836324	0842407
WM3x(Proposed)	0836206	0842270

New Proposed Wate Quality Monitoring Location in May 2016		
Location ID	Easting	Northing
WM2A (Original)	834204	844471
WM2A(a) (Proposed	834191	844474

Rev	Date	Drawn	Description	Ch'k'd	App'd
P2	NOV 10	MING	GENERAL REVISION	HC	HT
P1	OCT 10	MING	FIRST ISSUE	HC	HT

Mott MacDonald
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Client

CEDD — CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project

AGREEMENT NO. CE45/2008(CE)
LIANTANG/HEUNG YUEN WAI BOUNDARY CONTROL POINT AND ASSOCIATED WORKS

Title

LOCATIONS OF PROPOSED WATER QUALITY MONITORING STATIONS

Designed	HC		Eng.Chk.	EC	
Drawn	MING		Coordination	EC	
Dwg.Chk.	HC		Approved	HT	
Scale at A1	1:20000	Project	255228	Status	PRE
Drawing No	Appendix C	CAD file	\\255228\REPORT\ENV\EM&A\DWG\FIG 4-Locn	Rev	P2

Appendix F

Calibration Certificate of Monitoring Equipment and HOKLAS-accreditation Certificate of the Testing Laboratory

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Open area at Tsung Yuen Ha Village		Date of Calibration:	13/12/2017
Location ID : AM1b		Next Calibration Date:	13/2/2018
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1017.7	Corrected Pressure (mm Hg)	763.275
Temperature (°C)	18.4	Temperature (K)	291

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11965
Model->	5025A	Qstd Intercept ->	-0.02696
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.3	6.3	12.6	1.710	50	50.67	Slope = 30.6470
13	4.8	4.8	9.6	1.494	44	44.59	Intercept = -1.4749
10	3.8	3.8	7.6	1.331	39	39.52	Corr. coeff. = 0.9997
7	2.5	2.5	5.0	1.082	31	31.42	
5	1.5	1.5	3.0	0.841	24	24.32	

Calculations :

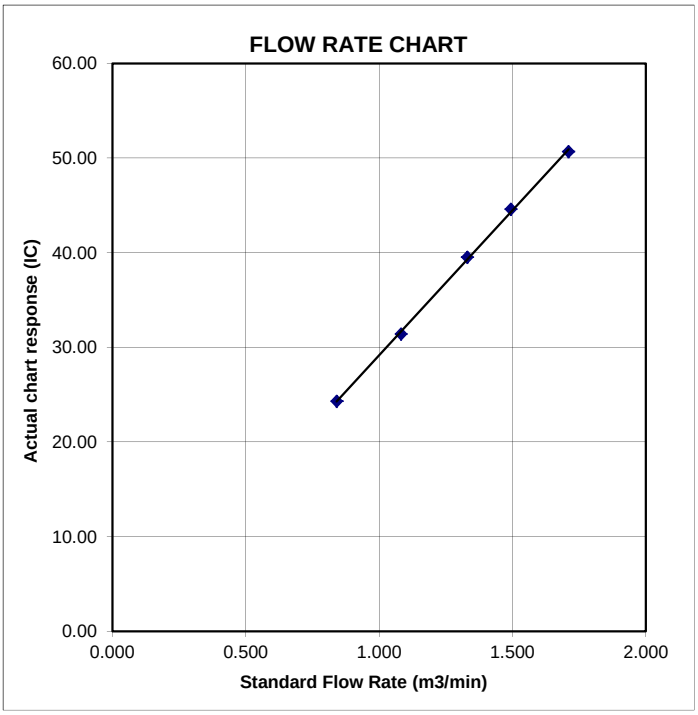
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Village House near Lin Ma Hang Road		Date of Calibration:	13/12/2017
Location ID : AM2		Next Calibration Date:	13/2/2018
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1017.7	Corrected Pressure (mm Hg)	763.275
Temperature (ºC)	18.4	Temperature (K)	291

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11965
Model->	5025A	Qstd Intercept ->	-0.02696
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	5.9	5.9	11.8	1.655	53	53.71	Slope = 30.1745
13	4.9	4.9	9.8	1.509	47	47.63	Intercept = 2.7823
10	3.7	3.7	7.4	1.313	41	41.55	Corr. coeff. = 0.9971
7	2.3	2.3	4.6	1.038	34	34.46	
5	1.5	1.5	3.0	0.841	28	28.38	

Calculations :

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

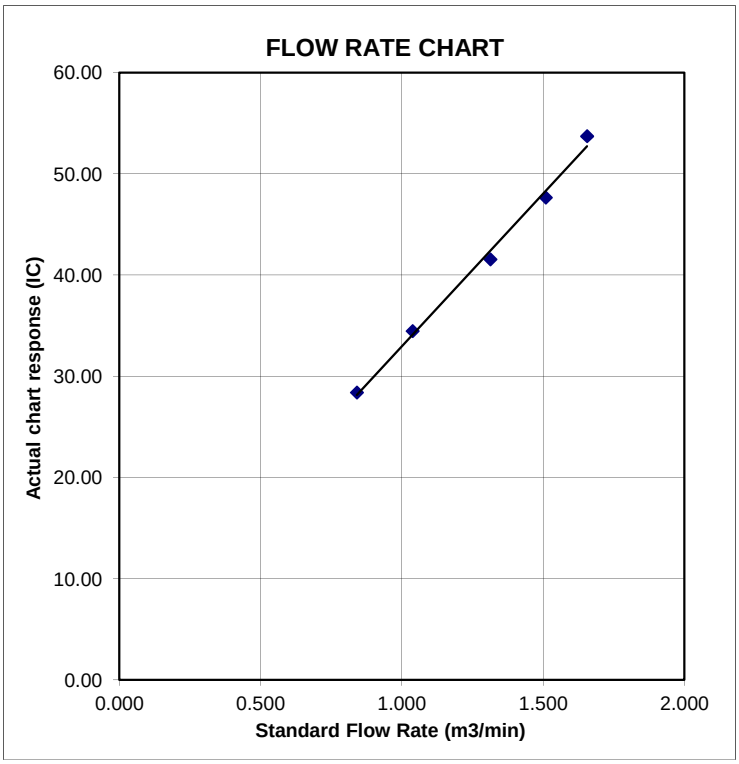
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Ta Kwu Ling Fire Service Station		Date of Calibration:	13/12/2017
Location ID : AM3		Next Calibration Date:	13/2/2018
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1017.7	Corrected Pressure (mm Hg)	763.275
Temperature (°C)	18.4	Temperature (K)	291

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11965
Model->	5025A	Qstd Intercept ->	-0.02696
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.4	6.4	12.8	1.723	55	55.74	Slope = 30.4090
13	4.9	4.9	9.8	1.509	48	48.65	Intercept = 3.0143
10	3.8	3.8	7.6	1.331	42	42.56	Corr. coeff. = 0.9936
7	2.3	2.3	4.6	1.038	36	36.48	
5	1.6	1.6	3.2	0.868	28	28.38	

Calculations :

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

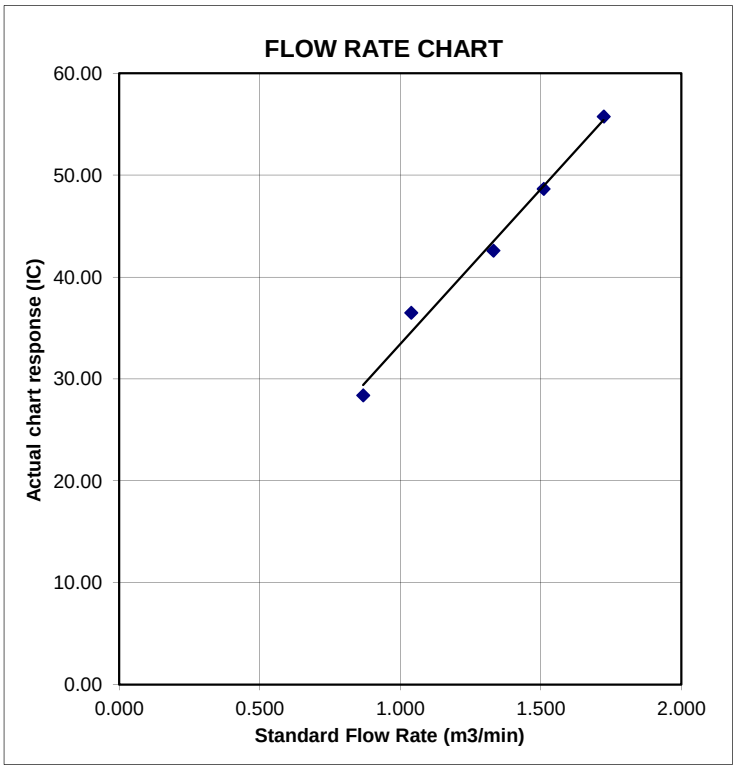
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Nga Yiu Ha Village
Location ID : AM4b

Date of Calibration: 13/12/2017
Next Calibration Date: 13/2/2018
Technician: Fai So

CONDITIONS

Sea Level Pressure (hPa)	1017.7	Corrected Pressure (mm Hg)	763.275
Temperature (°C)	18.4	Temperature (K)	291

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11965
Model->	5025A	Qstd Intercept ->	-0.02696
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6	6	12.0	1.669	60	60.81	Slope = 33.1873
13	4.6	4.6	9.2	1.463	55	55.74	Intercept = 6.4656
10	3.7	3.7	7.4	1.313	50	50.67	Corr. coeff. = 0.9966
7	2.3	2.3	4.6	1.038	41	41.55	
5	1.5	1.5	3.0	0.841	33	33.44	

Calculations :

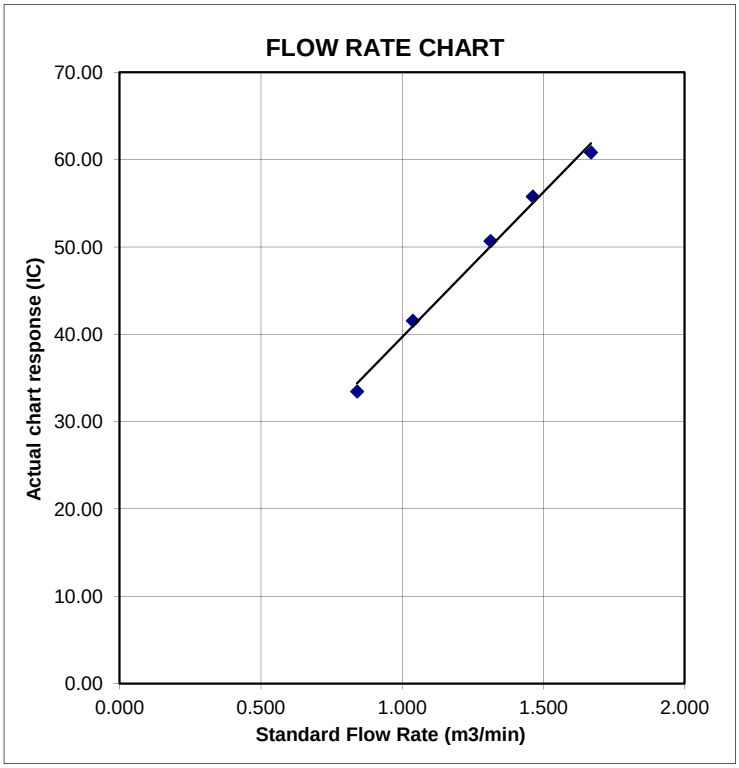
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Ping Yeung Village House		Date of Calibration:	13/12/2017
Location ID : AM5a		Next Calibration Date:	13/2/2018
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1017.7	Corrected Pressure (mm Hg)	763.275
Temperature (°C)	18.4	Temperature (K)	291

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11965
Model->	5025A	Qstd Intercept ->	-0.02696
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.7	6.7	13.4	1.763	60	60.81	Slope = 41.2012
13	5.4	5.4	10.8	1.584	53	53.71	Intercept = -11.1279
10	4	4	8.0	1.365	46	46.62	Corr. coeff. = 0.9966
7	2.5	2.5	5.0	1.082	34	34.46	
5	1.7	1.7	3.4	0.894	24	24.32	

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)

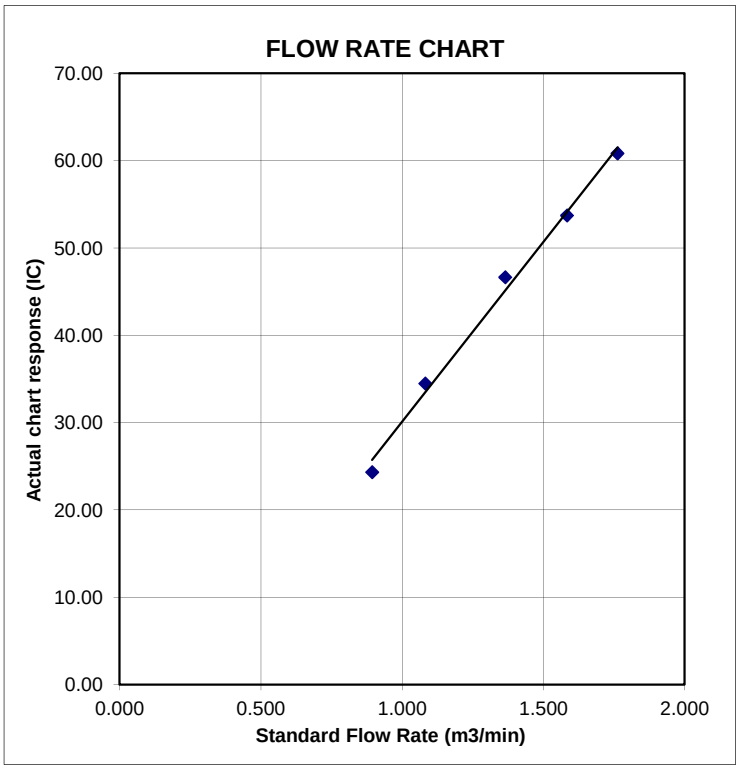
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Wo Keng Shan Village House		Date of Calibration:	13/12/2017
Location ID : AM6		Next Calibration Date:	13/2/2018
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1017.7	Corrected Pressure (mm Hg)	763.275
Temperature (°C)	18.4	Temperature (K)	291

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11965
Model->	5025A	Qstd Intercept ->	-0.02696
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6	6	12.0	1.669	56	56.75	Slope = 38.0068
13	4.7	4.7	9.4	1.479	50	50.67	Intercept = -6.6058
10	3.7	3.7	7.4	1.313	42	42.56	Corr. coeff. = 0.9966
7	2.4	2.4	4.8	1.060	32	32.43	
5	1.5	1.5	3.0	0.841	26	26.35	

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)

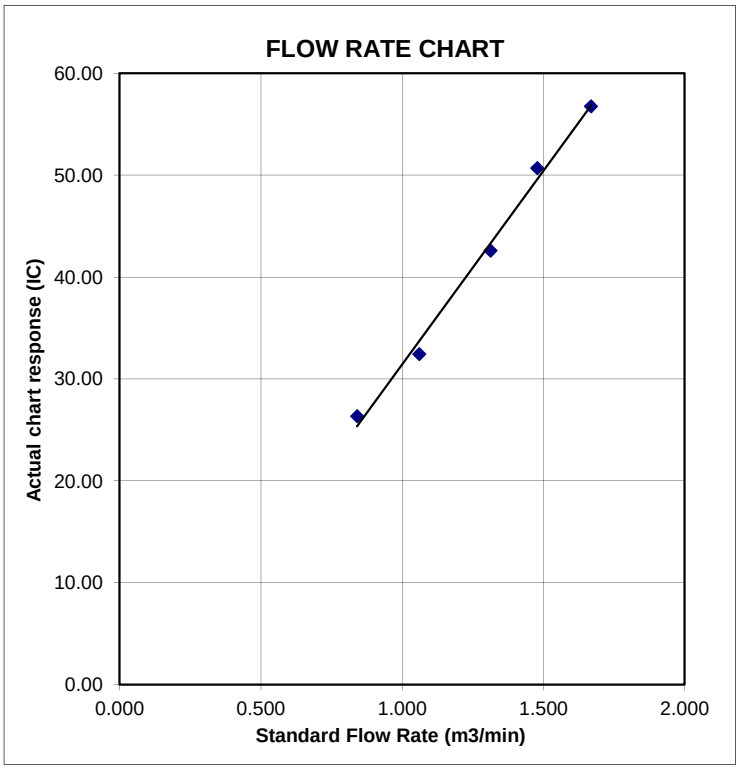
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Village House of Loi Tung Village
Location ID : AM7b

Date of Calibration: 13/12/2017
Next Calibration Date: 13/2/2018
Technician: Fai So

CONDITIONS

Sea Level Pressure (hPa)	1017.7	Corrected Pressure (mm Hg)	763.275
Temperature (°C)	18.4	Temperature (K)	291

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11965
Model->	5025A	Qstd Intercept ->	-0.02696
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.4	6.4	12.8	1.723	60	60.81	Slope = 31.5946
13	4.9	4.9	9.8	1.509	55	55.74	Intercept = 7.0789
10	3.9	3.9	7.8	1.348	49	49.66	Corr. coeff. = 0.9985
7	2.4	2.4	4.8	1.060	40	40.54	
5	1.5	1.5	3.0	0.841	33	33.44	

Calculations :

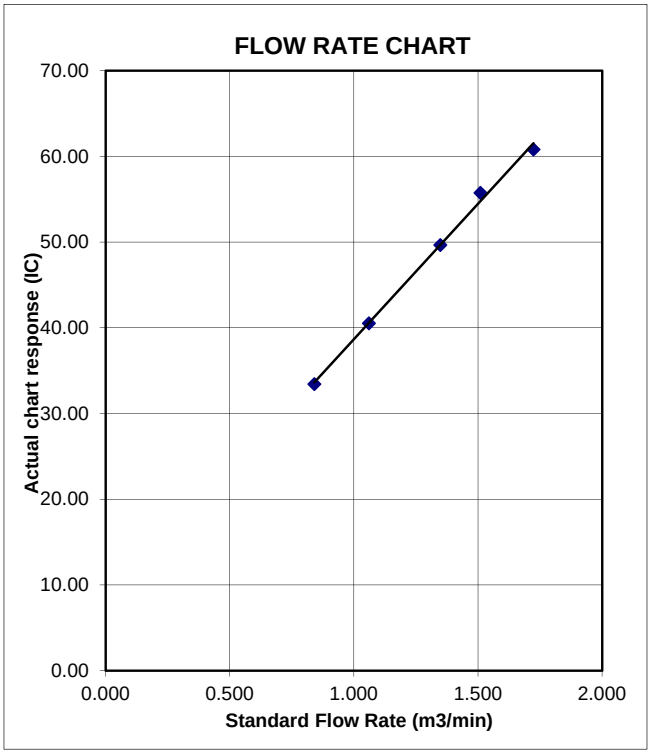
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Po Kat Tsai Village No. 4
Location ID : AM8

Date of Calibration: 13/12/2017
Next Calibration Date: 13/2/2018
Technician: Fai So

CONDITIONS

Sea Level Pressure (hPa)	1017.7	Corrected Pressure (mm Hg)	763.275
Temperature (°C)	18.4	Temperature (K)	291

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11965
Model->	5025A	Qstd Intercept ->	-0.02696
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected
18	5.9	5.9	11.8	1.655	60	60.81
13	4.9	4.9	9.8	1.509	50	50.67
10	3.9	3.9	7.8	1.348	43	43.58
7	2.5	2.5	5.0	1.082	32	32.43
5	1.5	1.5	3.0	0.841	20	20.27

LINEAR REGRESSION

Slope = 47.9387
Intercept = -20.1485
Corr. coeff. = 0.9968

Calculations :

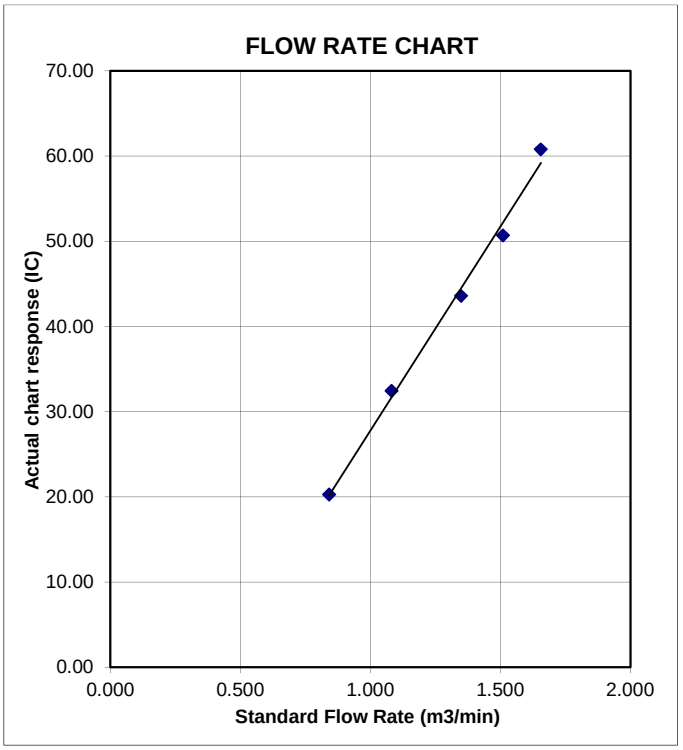
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location : Nam Wa Po Village House No. 80		Date of Calibration:	13/12/2017
Location ID : AM9b		Next Calibration Date:	13/2/2018
		Technician:	Fai So

CONDITIONS

Sea Level Pressure (hPa)	1017.7	Corrected Pressure (mm Hg)	763.275
Temperature (°C)	18.4	Temperature (K)	291

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11965
Model->	5025A	Qstd Intercept ->	-0.02696
Serial # ->	1941		

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.4	6.4	12.8	1.723	54	54.73	Slope = 32.3705
13	5.1	5.1	10.2	1.540	49	49.66	Intercept = -0.3792
10	3.9	3.9	7.8	1.348	43	43.58	Corr. coeff. = 0.9953
7	2.4	2.4	4.8	1.060	35	35.47	
5	1.6	1.6	3.2	0.868	26	26.35	

Calculations :

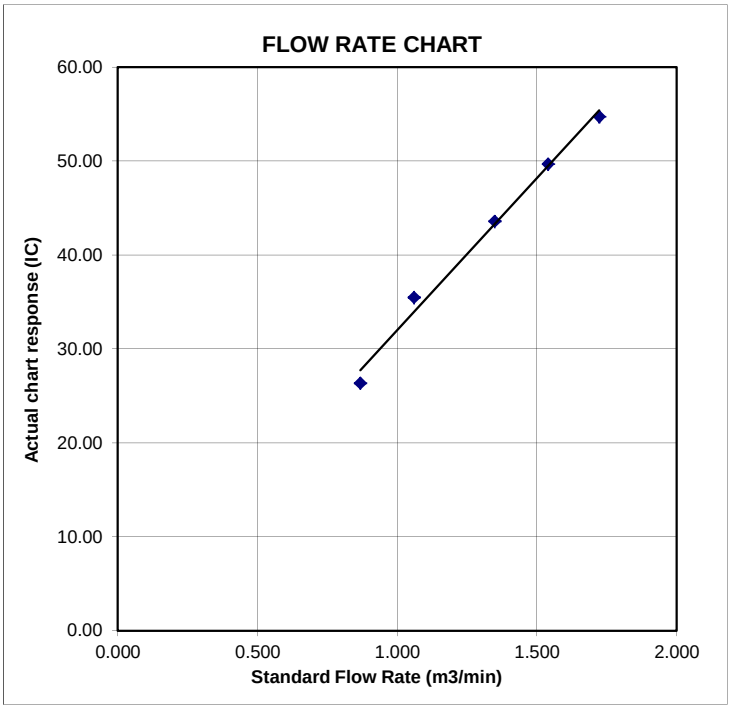
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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
Pav = daily average pressure



TISCH Environmental

TISCH ENVIRONMENTAL, INC.
145 SOUTH MIAMI AVE
VILLAGE OF CLEVES, OH
45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Feb 28, 2017 Rootsmeter S/N 0438320 Ta (K) - 294
Operator Tisch Orifice I.D. - 1941 Pa (mm) - 750.57

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.4600	3.2	2.00
2	NA	NA	1.00	1.0410	6.4	4.00
3	NA	NA	1.00	0.9280	7.9	5.00
4	NA	NA	1.00	0.8840	8.7	5.50
5	NA	NA	1.00	0.7290	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9967	0.6827	1.4149		0.9957	0.6820	0.8851
0.9925	0.9534	2.0010		0.9915	0.9524	1.2517
0.9904	1.0672	2.2372		0.9894	1.0661	1.3995
0.9894	1.1192	2.3464		0.9884	1.1181	1.4678
0.9840	1.3499	2.8299		0.9830	1.3485	1.7702
Qstd slope (m) =		2.11965		Qa slope (m) =		1.32729
intercept (b) =		-0.02696		intercept (b) =		-0.01686
coefficient (r) =		0.99991		coefficient (r) =		0.99991
y axis = SQRT[H2O(Pa/760)(298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{[SQRT(H2O(Pa/760)(298/Ta))]- b}
Qa = 1/m{[SQRT H2O(Ta/Pa)]- b}

Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	2X6145
Equipment Ref:	EQ105
Job Order	HK1703462

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	25 November 2016

Equipment Verification Results:

Testing Date: 9 January 2017

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
3hr14min	09:10 ~ 12:24	20.6	1016.3	0.145	13025	67.2
1hr57min	12:30 ~ 14:27	20.6	1016.3	0.069	3586	30.6
1hr58min	14:35 ~ 16:33	20.6	1016.3	0.091	4709	39.6

Sensitivity Adjustment Scale Setting (Before Calibration) 581 (CPM)

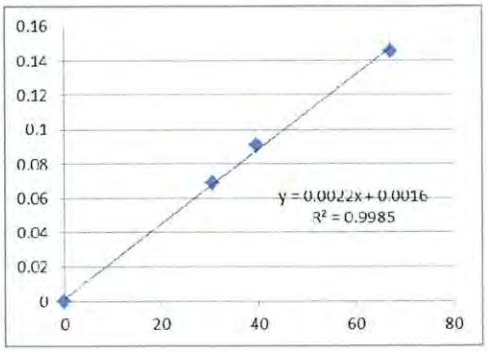
Sensitivity Adjustment Scale Setting (After Calibration) 580 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9992

Date of Issue 11 January 2017



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

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

Operator : Martin Li Signature : Date : 11 January 2017

QC Reviewer : Ben Tam Signature : Date : 11 January 2017

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	25-Nov-16
Location ID :	Calibration Room	Next Calibration Date:	25-Feb-17

CONDITIONS

Sea Level Pressure (hPa)	1016.4	Corrected Pressure (mm Hg)	762.3
Temperature (°C)	20.0	Temperature (K)	293

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Calibration Date->	14-Mar-16	Expiry Date->	14-Mar-17

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.1	6.1	12.2	1.776	56	56.56	Slope = 35.6871
13	4.7	4.7	9.4	1.560	49	49.49	Intercept = -6.1123
10	3.6	3.6	7.2	1.368	43	43.43	Corr. coeff. = 0.9967
8	2.3	2.3	4.6	1.096	34	34.34	
5	1.4	1.4	2.8	0.859	23	23.23	

Calculations :

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

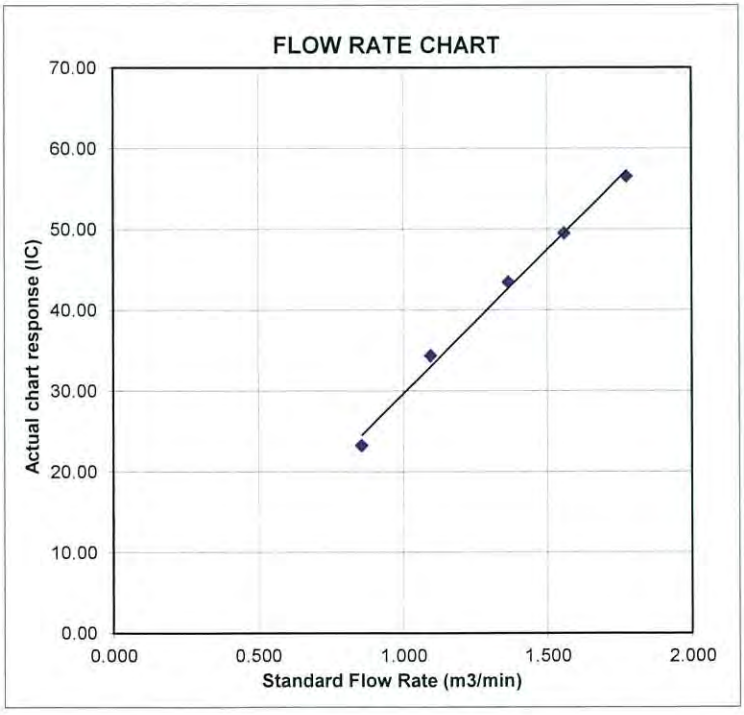
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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
Pav = daily average pressure



Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	366409
Equipment Ref:	EQ109
Job Order	HK1703455

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	25 November 2016

Equipment Verification Results:

Testing Date: 9 January 2017

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
3hr14min	09:10 ~ 12:24	20.6	1016.3	0.145	12487	64.4
1hr57min	12:30 ~ 14:27	20.6	1016.3	0.069	3433	29.3
1hr58min	14:35 ~ 16:33	20.6	1016.3	0.091	4815	40.5

Sensitivity Adjustment Scale Setting (Before Calibration) 523 (CPM)

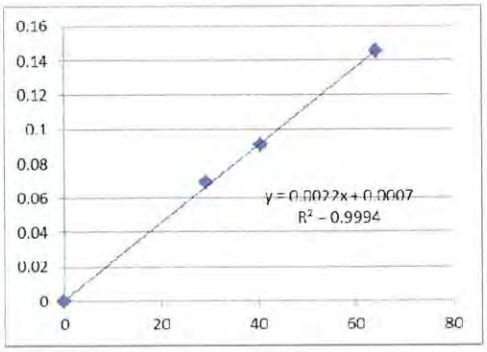
Sensitivity Adjustment Scale Setting (After Calibration) 525 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9997

Date of Issue 11 January 2017



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

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

Operator : Martin Li Signature : Date : 11 January 2017

QC Reviewer : Ben Tam Signature : Date : 11 January 2017

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	25-Nov-16
Location ID :	Calibration Room	Next Calibration Date:	25-Feb-17

CONDITIONS

Sea Level Pressure (hPa)	1016.4	Corrected Pressure (mm Hg)	762.3
Temperature (°C)	20.0	Temperature (K)	293

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Calibration Date->	14-Mar-16	Expiry Date->	14-Mar-17

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.1	6.1	12.2	1.776	56	56.56	Slope = 35.6871
13	4.7	4.7	9.4	1.560	49	49.49	Intercept = -6.1123
10	3.6	3.6	7.2	1.368	43	43.43	Corr. coeff. = 0.9967
8	2.3	2.3	4.6	1.096	34	34.34	
5	1.4	1.4	2.8	0.859	23	23.23	

Calculations :

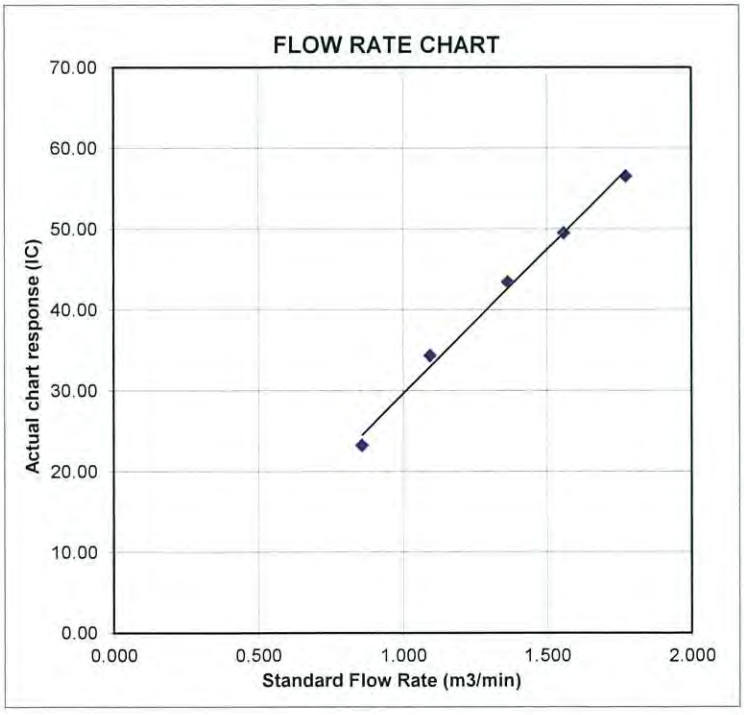
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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
Pav = daily average pressure



Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	366410
Equipment Ref:	EQ110
Job Order	HK1703460

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	25 November 2016

Equipment Verification Results:

Testing Date: 9 January 2017

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
3hr14min	09:10 ~ 12:24	20.6	1016.3	0.145	12401	64.0
1hr57min	12:30 ~ 14:27	20.6	1016.3	0.069	3266	27.9
1hr58min	14:35 ~ 16:33	20.6	1016.3	0.091	4878	41.1

Sensitivity Adjustment Scale Setting (Before Calibration) 677 (CPM)

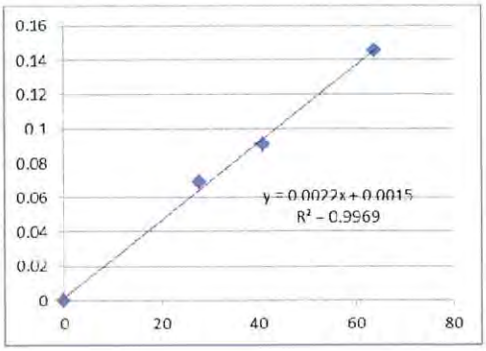
Sensitivity Adjustment Scale Setting (After Calibration) 675 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9984

Date of Issue 11 January 2017



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

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

Operator : Martin Li Signature : Date : 11 January 2017

QC Reviewer : Ben Tam Signature : Date : 11 January 2017

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	25-Nov-16
Location ID :	Calibration Room	Next Calibration Date:	25-Feb-17

CONDITIONS

Sea Level Pressure (hPa)	1016.4	Corrected Pressure (mm Hg)	762.3
Temperature (°C)	20.0	Temperature (K)	293

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Calibration Date->	14-Mar-16	Expiry Date->	14-Mar-17

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected
18	6.1	6.1	12.2	1.776	56	56.56
13	4.7	4.7	9.4	1.560	49	49.49
10	3.6	3.6	7.2	1.368	43	43.43
8	2.3	2.3	4.6	1.096	34	34.34
5	1.4	1.4	2.8	0.859	23	23.23

LINEAR REGRESSION

Slope = 35.6871
Intercept = -6.1123
Corr. coeff. = 0.9967

Calculations :

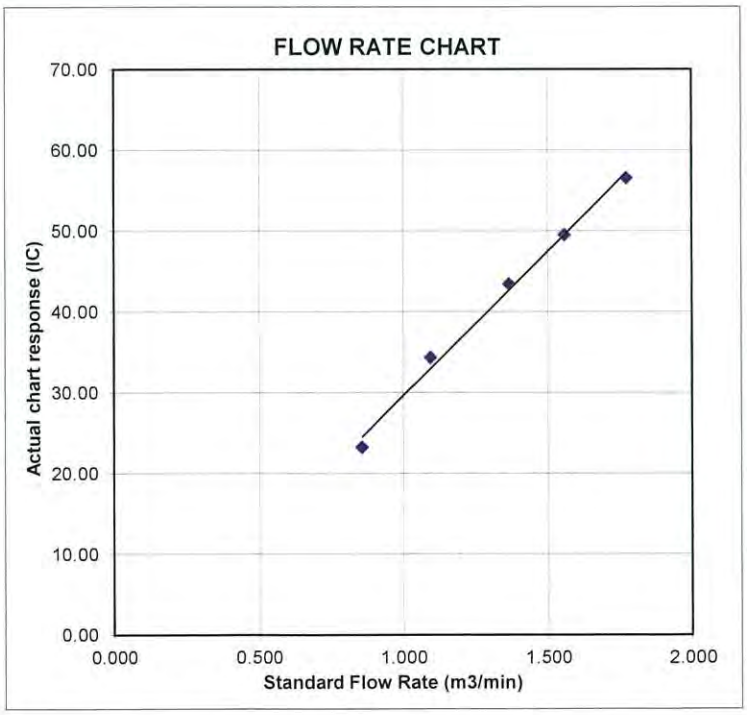
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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
Pav = daily average pressure



Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	3Y6503
Equipment Ref:	EQ112
Job Order	HK1703461

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	25 November 2016

Equipment Verification Results:

Testing Date: 9 January 2017

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
3hr14min	09:10 ~ 12:24	20.6	1016.3	0.145	12647	65.3
1hr57min	12:30 ~ 14:27	20.6	1016.3	0.069	3476	29.7
1hr58min	14:35 ~ 16:33	20.6	1016.3	0.091	4876	41.0

Sensitivity Adjustment Scale Setting (Before Calibration) 654 (CPM)

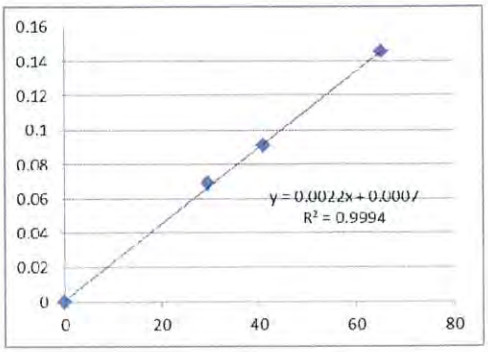
Sensitivity Adjustment Scale Setting (After Calibration) 658 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9997

Date of Issue 11 January 2017



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

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

Operator : Martin Li Signature : Date : 11 January 2017

QC Reviewer : Ben Tam Signature : Date : 11 January 2017

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	25-Nov-16
Location ID :	Calibration Room	Next Calibration Date:	25-Feb-17

CONDITIONS

Sea Level Pressure (hPa)	1016.4	Corrected Pressure (mm Hg)	762.3
Temperature (°C)	20.0	Temperature (K)	293

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Calibration Date->	14-Mar-16	Expiry Date->	14-Mar-17

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.1	6.1	12.2	1.776	56	56.56	Slope = 35.6871
13	4.7	4.7	9.4	1.560	49	49.49	Intercept = -6.1123
10	3.6	3.6	7.2	1.368	43	43.43	Corr. coeff. = 0.9967
8	2.3	2.3	4.6	1.096	34	34.34	
5	1.4	1.4	2.8	0.859	23	23.23	

Calculations :

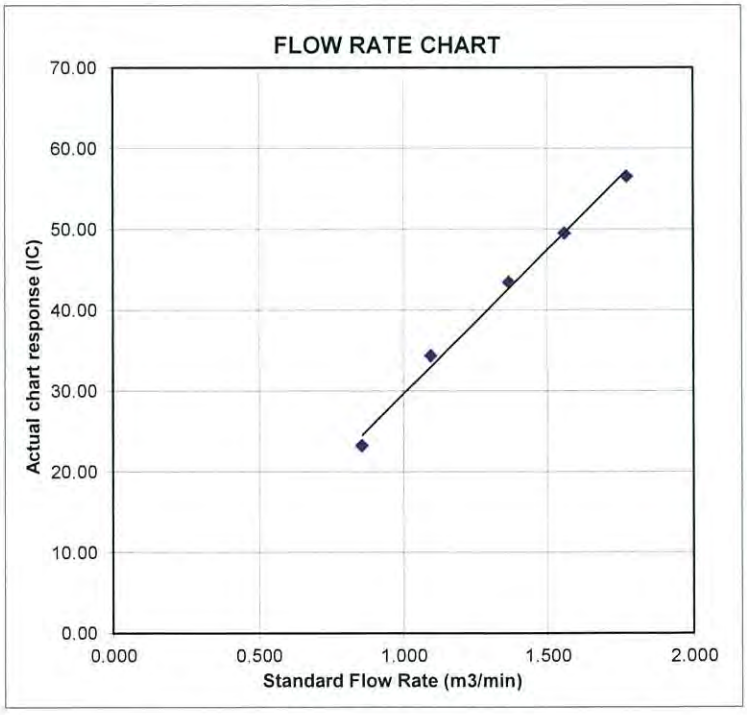
Qstd = 1/m[Sqrt(H20(Pa/Pstd)(Tstd/Ta))-b]
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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
Pav = daily average pressure



Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	3Y6505
Equipment Ref:	EQ114
Job Order	HK1703464

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	25 November 2016

Equipment Verification Results:

Testing Date: 9 January 2017

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
3hr14min	09:10 ~ 12:24	20.6	1016.3	0.145	12588	65.0
1hr57min	12:30 ~ 14:27	20.6	1016.3	0.069	3339	28.5
1hr58min	14:35 ~ 16:33	20.6	1016.3	0.091	4774	40.2

Sensitivity Adjustment Scale Setting (Before Calibration) 588 (CPM)

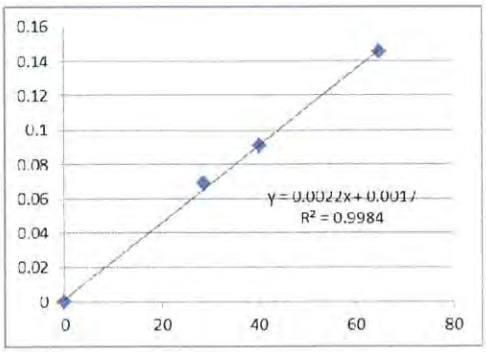
Sensitivity Adjustment Scale Setting (After Calibration) 587 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9992

Date of Issue 11 January 2017



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

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

Operator : Martin Li Signature : Date : 11 January 2017

QC Reviewer : Ben Tam Signature : Date : 11 January 2017

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	25-Nov-16
Location ID :	Calibration Room	Next Calibration Date:	25-Feb-17

CONDITIONS

Sea Level Pressure (hPa)	1016.4	Corrected Pressure (mm Hg)	762.3
Temperature (°C)	20.0	Temperature (K)	293

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.00411
Model->	5025A	Qstd Intercept ->	-0.03059
Calibration Date->	14-Mar-16	Expiry Date->	14-Mar-17

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.1	6.1	12.2	1.776	56	56.56	Slope = 35.6871
13	4.7	4.7	9.4	1.560	49	49.49	Intercept = -6.1123
10	3.6	3.6	7.2	1.368	43	43.43	Corr. coeff. = 0.9967
8	2.3	2.3	4.6	1.096	34	34.34	
5	1.4	1.4	2.8	0.859	23	23.23	

Calculations :

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

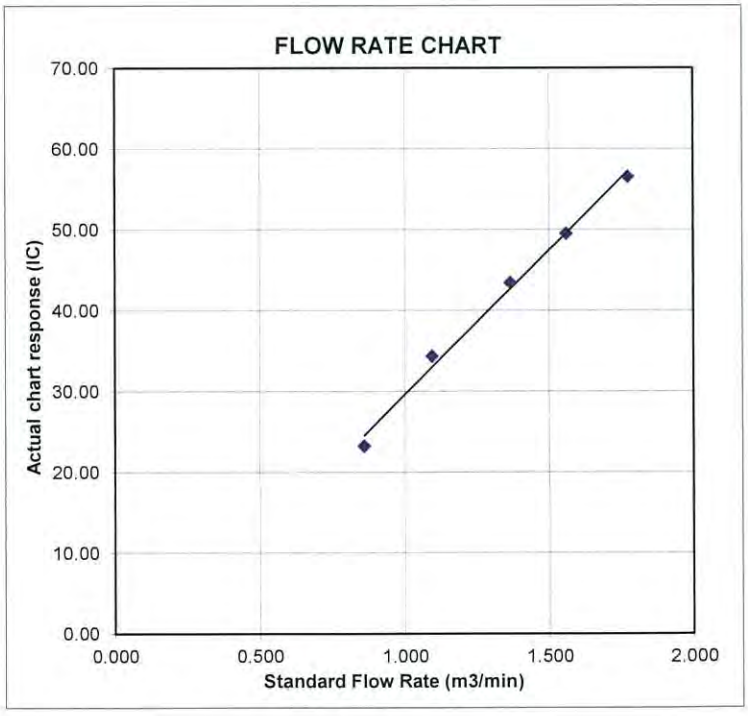
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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
Pav = daily average pressure



Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	2X6145
Equipment Ref:	EQ105
Job Order	HK1815073

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	1 December 2017

Equipment Verification Results:

Testing Date: 5 January 2018

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr07min	10:27 ~ 12:34	19.3	1015.3	0.011	511	4.0
2hr01min	12:38 ~ 14:39	19.3	1015.3	0.012	598	4.9
2hr08min	14:42 ~ 16:50	19.3	1015.3	0.036	2111	16.5

Sensitivity Adjustment Scale Setting (Before Calibration) 583 (CPM)

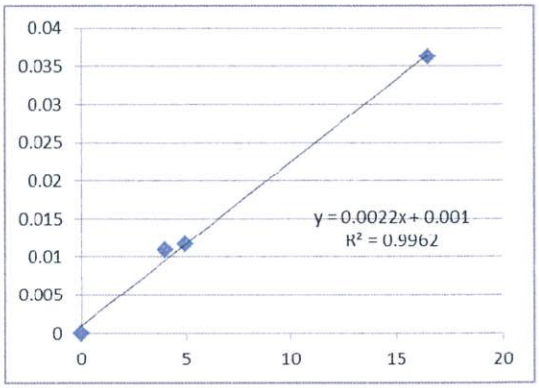
Sensitivity Adjustment Scale Setting (After Calibration) 583 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9981

Date of Issue 9 January 2018



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

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

Operator : Martin Li Signature : Date : 9 January 2018

QC Reviewer : Ben Tam Signature : Date : 9 January 2018

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	1-Dec-17
Location ID :	Calibration Room	Next Calibration Date:	1-Mar-18

CONDITIONS

Sea Level Pressure (hPa)	1018.8	Corrected Pressure (mm Hg)	764.1
Temperature (°C)	21.2	Temperature (K)	294

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11965
Model->	5025A	Qstd Intercept ->	-0.02696
Calibration Date->	28-Feb-17	Expiry Date->	28-Feb-18

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.3	6.3	12.6	1.703	54	54.49	Slope = 31.2239
13	5	5	10.0	1.518	48	48.44	Intercept = 0.7901
10	3.9	3.9	7.8	1.342	42	42.38	Corr. coeff. = 0.9971
8	2.4	2.4	4.8	1.056	32	32.29	
5	1.0	1.0	2.0	0.686	23	23.21	

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)

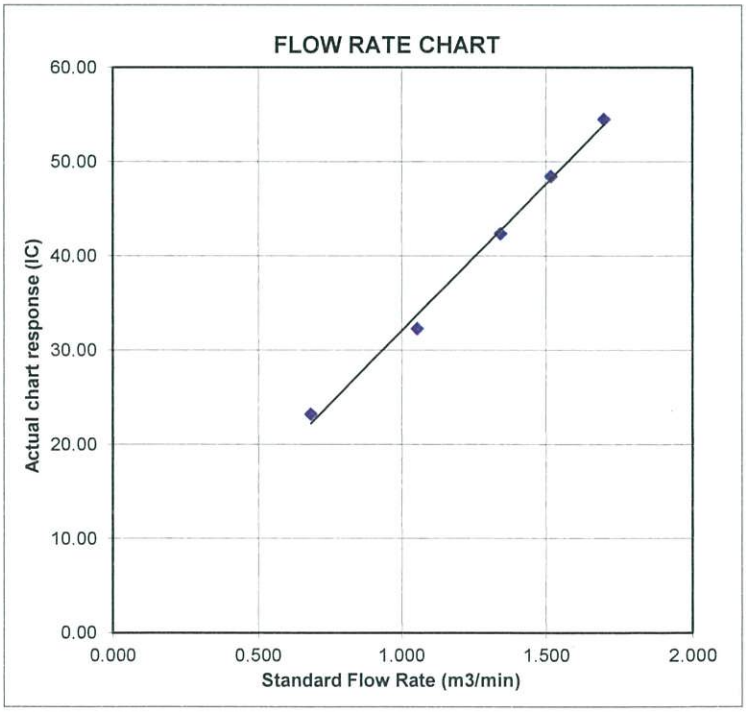
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	366409
Equipment Ref:	EQ109
Job Order	HK1815078

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	1 December 2017

Equipment Verification Results:

Testing Date: 5 January 2018

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m^3 (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr07min	10:27 ~ 12:34	19.3	1015.3	0.011	474	3.7
2hr01min	12:38 ~ 14:39	19.3	1015.3	0.012	577	4.8
2hr08min	14:42 ~ 16:50	19.3	1015.3	0.036	2097	16.4

Sensitivity Adjustment Scale Setting (Before Calibration) 520 (CPM)

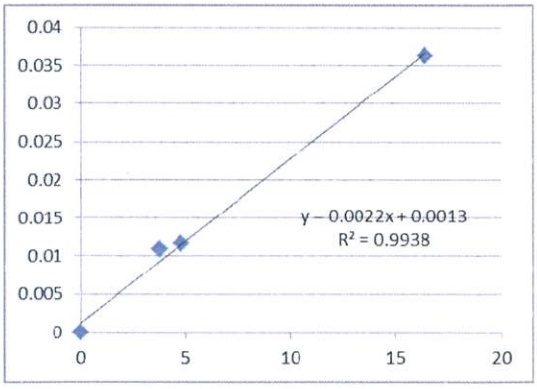
Sensitivity Adjustment Scale Setting (After Calibration) 521 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9967

Date of Issue 9 January 2018



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

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

Operator : Martin Li Signature : Date : 9 January 2018

QC Reviewer : Ben Tam Signature : Date : 9 January 2018

Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	366410
Equipment Ref:	EQ110
Job Order	HK1815072

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	1 December 2017

Equipment Verification Results:

Testing Date: 5 January 2018

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr07min	10:27 ~ 12:34	19.3	1015.3	0.011	498	3.9
2hr01min	12:38 ~ 14:39	19.3	1015.3	0.012	571	4.7
2hr08min	14:42 ~ 16:50	19.3	1015.3	0.036	2095	16.4

Sensitivity Adjustment Scale Setting (Before Calibration) 670 (CPM)

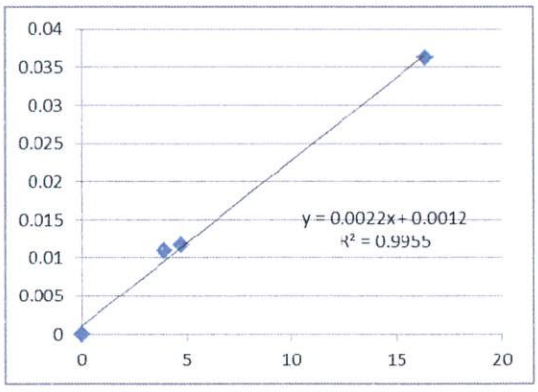
Sensitivity Adjustment Scale Setting (After Calibration) 669 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9977

Date of Issue 9 January 2018



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

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

Operator : Martin Li Signature : Date : 9 January 2018

QC Reviewer : Ben Tam Signature : Date : 9 January 2018

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	1-Dec-17
Location ID :	Calibration Room	Next Calibration Date:	1-Mar-18

CONDITIONS

Sea Level Pressure (hPa)	1018.8	Corrected Pressure (mm Hg)	764.1
Temperature (°C)	21.2	Temperature (K)	294

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11965
Model->	5025A	Qstd Intercept ->	-0.02696
Calibration Date->	28-Feb-17	Expiry Date->	28-Feb-18

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.3	6.3	12.6	1.703	54	54.49	Slope = 31.2239
13	5	5	10.0	1.518	48	48.44	Intercept = 0.7901
10	3.9	3.9	7.8	1.342	42	42.38	Corr. coeff. = 0.9971
8	2.4	2.4	4.8	1.056	32	32.29	
5	1.0	1.0	2.0	0.686	23	23.21	

Calculations :

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

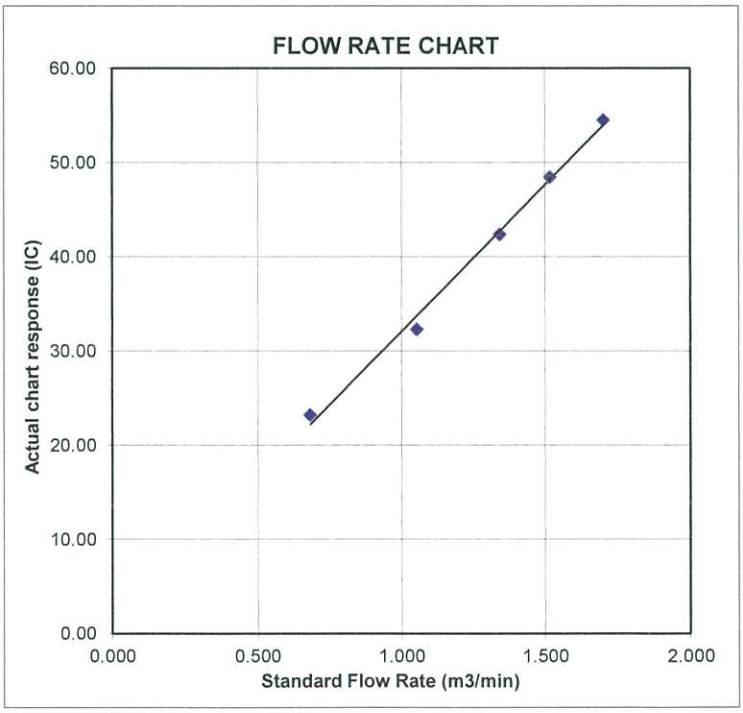
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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
Pav = daily average pressure



TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	1-Dec-17
Location ID :	Calibration Room	Next Calibration Date:	1-Mar-18

CONDITIONS

Sea Level Pressure (hPa)	1018.8	Corrected Pressure (mm Hg)	764.1
Temperature (°C)	21.2	Temperature (K)	294

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11965
Model->	5025A	Qstd Intercept ->	-0.02696
Calibration Date->	28-Feb-17	Expiry Date->	28-Feb-18

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.3	6.3	12.6	1.703	54	54.49	Slope = 31.2239
13	5	5	10.0	1.518	48	48.44	Intercept = 0.7901
10	3.9	3.9	7.8	1.342	42	42.38	Corr. coeff. = 0.9971
8	2.4	2.4	4.8	1.056	32	32.29	
5	1.0	1.0	2.0	0.686	23	23.21	

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)

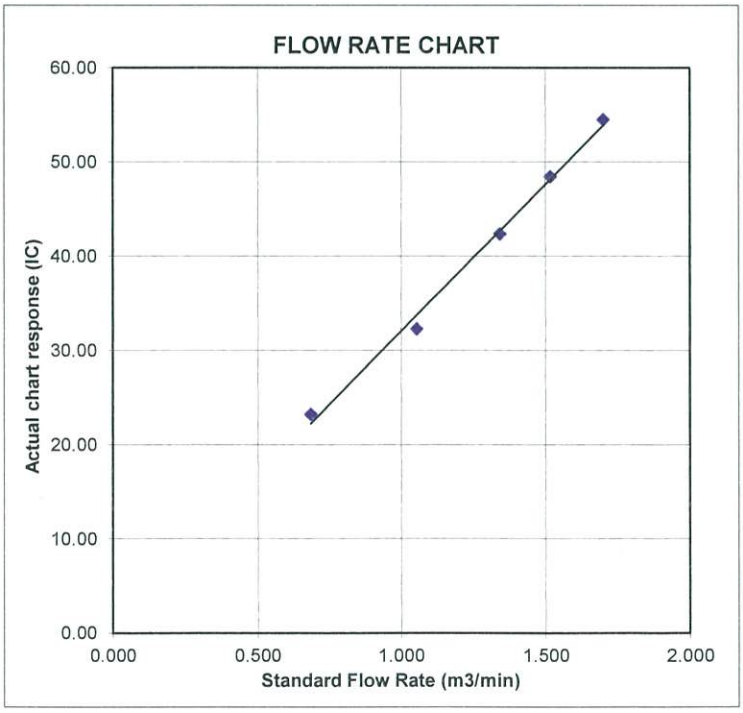
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	3Y6503
Equipment Ref:	EQ112
Job Order	HK1815077

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	1 December 2017

Equipment Verification Results:

Testing Date: 5 January 2018

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr07min	10:27 ~ 12:34	19.3	1015.3	0.011	521	4.1
2hr01min	12:38 ~ 14:39	19.3	1015.3	0.012	674	5.6
2hr08min	14:42 ~ 16:50	19.3	1015.3	0.036	2077	16.3

Sensitivity Adjustment Scale Setting (Before Calibration) 661 (CPM)

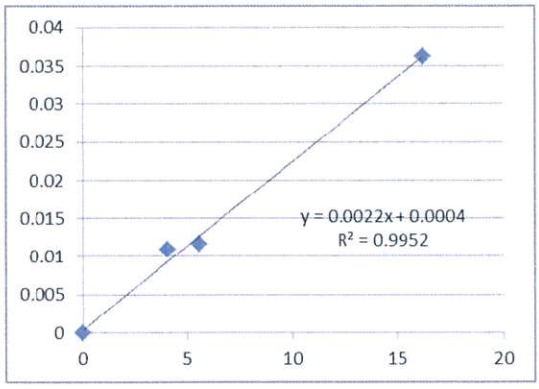
Sensitivity Adjustment Scale Setting (After Calibration) 661 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9976

Date of Issue 9 January 2018



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

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

Operator : Martin Li Signature : Date : 9 January 2018

QC Reviewer : Ben Tam Signature : Date : 9 January 2018

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	1-Dec-17
Location ID :	Calibration Room	Next Calibration Date:	1-Mar-18

CONDITIONS

Sea Level Pressure (hPa)	1018.8	Corrected Pressure (mm Hg)	764.1
Temperature (°C)	21.2	Temperature (K)	294

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11965
Model->	5025A	Qstd Intercept ->	-0.02696
Calibration Date->	28-Feb-17	Expiry Date->	28-Feb-18

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.3	6.3	12.6	1.703	54	54.49	Slope = 31.2239
13	5	5	10.0	1.518	48	48.44	Intercept = 0.7901
10	3.9	3.9	7.8	1.342	42	42.38	Corr. coeff. = 0.9971
8	2.4	2.4	4.8	1.056	32	32.29	
5	1.0	1.0	2.0	0.686	23	23.21	

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)

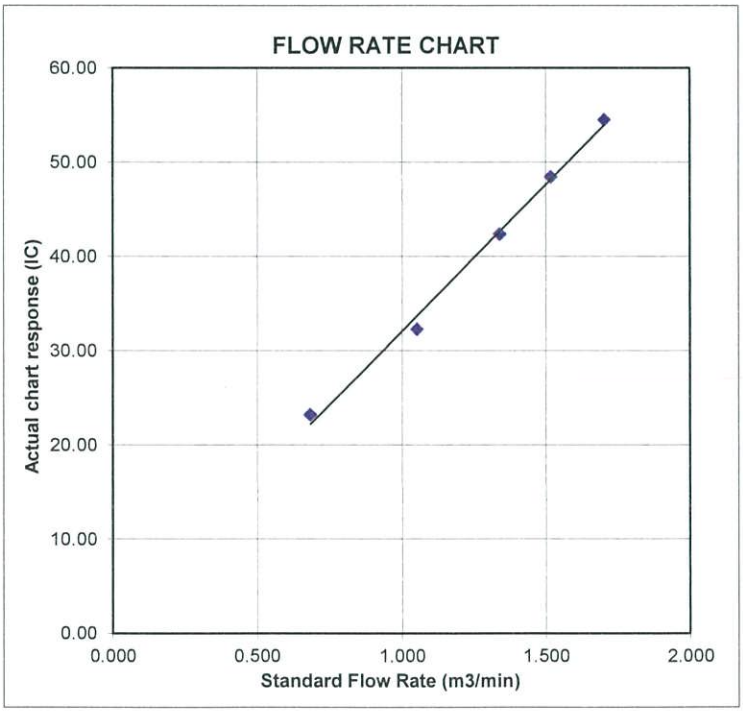
m = sampler slope

b = sampler intercept

I = chart response

Tav = daily average temperature

Pav = daily average pressure



Equipment Verification Report (TSP)

Equipment Calibrated:

Type:	Laser Dust monitor
Manufacturer:	Sibata LD-3B
Serial No.	3Y6505
Equipment Ref:	EQ114
Job Order	HK1815074

Standard Equipment:

Standard Equipment:	Higher Volume Sampler
Location & Location ID:	AUES office (calibration room)
Equipment Ref:	HVS 018
Last Calibration Date:	1 December 2017

Equipment Verification Results:

Testing Date: 5 January 2018

Hour	Time	Mean Temp °C	Mean Pressure (hPa)	Concentration in mg/m³ (Standard Equipment)	Total Count (Calibrated Equipment)	Count/Minute (Total Count/60min)
2hr07min	10:27 ~ 12:34	19.3	1015.3	0.011	677	5.3
2hr01min	12:38 ~ 14:39	19.3	1015.3	0.012	601	5.0
2hr08min	14:42 ~ 16:50	19.3	1015.3	0.036	2064	16.2

Sensitivity Adjustment Scale Setting (Before Calibration) 591 (CPM)

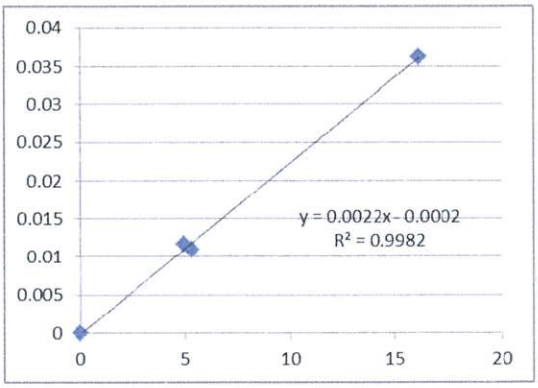
Sensitivity Adjustment Scale Setting (After Calibration) 590 (CPM)

Linear Regression of Y or X

Slope (K-factor): 0.0022

Correlation Coefficient 0.9991

Date of Issue 9 January 2018



Remarks:

1. **Strong** Correlation (R>0.8)
2. Factor 0.0022 should be apply for TSP monitoring

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

Operator : Martin Li Signature : Date : 9 January 2018

QC Reviewer : Ben Tam Signature : Date : 9 January 2018

TSP SAMPLER CALIBRATION CALCULATION SPREADSHEET

Location :	Gold King Industrial Building, Kwai Chung	Date of Calibration:	1-Dec-17
Location ID :	Calibration Room	Next Calibration Date:	1-Mar-18

CONDITIONS

Sea Level Pressure (hPa)	1018.8	Corrected Pressure (mm Hg)	764.1
Temperature (°C)	21.2	Temperature (K)	294

CALIBRATION ORIFICE

Make->	TISCH	Qstd Slope ->	2.11965
Model->	5025A	Qstd Intercept ->	-0.02696
Calibration Date->	28-Feb-17	Expiry Date->	28-Feb-18

CALIBRATION

Plate No.	H20 (L) (in)	H2O (R) (in)	H20 (in)	Qstd (m3/min)	I (chart)	IC corrected	LINEAR REGRESSION
18	6.3	6.3	12.6	1.703	54	54.49	Slope = 31.2239
13	5	5	10.0	1.518	48	48.44	Intercept = 0.7901
10	3.9	3.9	7.8	1.342	42	42.38	Corr. coeff. = 0.9971
8	2.4	2.4	4.8	1.056	32	32.29	
5	1.0	1.0	2.0	0.686	23	23.21	

Calculations :

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

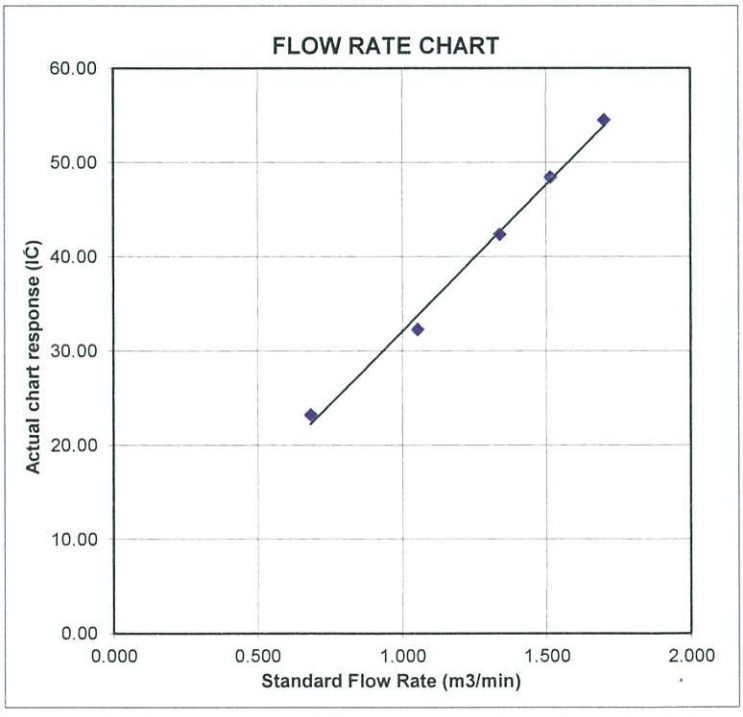
IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]

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
Pav = daily average pressure



輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C172288
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC17-0924) Date of Receipt / 收件日期 : 24 April 2017

Description / 儀器名稱 : Integrating Sound Level Meter (EQ006)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 2238
Serial No. / 編號 : 2285762
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 28 April 2017

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong
Technical Officer

Certified By 核證 : K C Lee
Project Engineer

Date of Issue 簽發日期 : 2 May 2017

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C172288
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration using laboratory acoustic calibrator was performed before the test from 6.1.1.2 to 6.4.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C170048
CL281	Multifunction Acoustic Calibrator	PA160023

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

6.1.1.1 Before Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L_{AFP}	A	F	94.00	1	94.1

6.1.1.2 After Self-calibration

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L_{AFP}	A	F	94.00	1	94.0	± 0.7

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
50 - 130	L_{AFP}	A	F	94.00	1	94.0 (Ref.)
				104.00		104.0
				114.00		114.0

IEC 60651 Type 1 Spec. : ± 0.4 dB per 10 dB step and ± 0.7 dB for overall different.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C172288
證書編號

6.2 Time Weighting

6.2.1 Continuous Signal

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
50 - 130	L_{AFP}	A	F	94.00	1	94.0	Ref.
	L_{ASP}		S			94.1	± 0.1
	L_{AIP}		I			94.1	± 0.1

6.2.2 Tone Burst Signal (2 kHz)

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Burst Duration		
30 - 110	L_{AFP}	A	F	106.0	Continuous	106.0	Ref.
	L_{AFMax}				200 ms	105.0	-1.0 ± 1.0
	L_{ASP}		S		Continuous	106.0	Ref.
	L_{ASMax}				500 ms	102.0	-4.1 ± 1.0

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{AFP}	A	F	94.00	31.5 Hz	55.1	-39.4 ± 1.5
					63 Hz	68.0	-26.2 ± 1.5
					125 Hz	77.8	-16.1 ± 1.0
					250 Hz	85.3	-8.6 ± 1.0
					500 Hz	90.8	-3.2 ± 1.0
					1 kHz	94.0	Ref.
					2 kHz	95.2	+1.2 ± 1.0
					4 kHz	95.0	+1.0 ± 1.0
					8 kHz	92.9	-1.1 (+1.5 ; -3.0)
					12.5 kHz	89.8	-4.3 (+3.0 ; -6.0)

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C172288
證書編號

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 60651 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
50 - 130	L_{CFP}	C	F	94.00	31.5 Hz	91.5	-3.0 ± 1.5
					63 Hz	93.4	-0.8 ± 1.5
					125 Hz	93.9	-0.2 ± 1.0
					250 Hz	94.1	0.0 ± 1.0
					500 Hz	94.1	0.0 ± 1.0
					1 kHz	94.1	Ref.
					2 kHz	93.9	-0.2 ± 1.0
					4 kHz	93.2	-0.8 ± 1.0
					8 kHz	91.0	-3.0 (+1.5 ; -3.0)
					12.5 kHz	87.9	-6.2 (+3.0 ; -6.0)

6.4 Time Averaging

UUT Setting				Applied Value					UUT Reading (dB)	IEC 60804 Type 1 Spec. (dB)
Range (dB)	Parameter	Frequency Weighting	Integrating Time	Frequency (kHz)	Burst Duration (ms)	Burst Duty Factor	Burst Level (dB)	Equivalent Level (dB)		
30 - 110	L_{Aeq}	A	10 sec.	4	1	1/10	110.0	100	100.0	± 0.5
						$1/10^2$		90	89.9	± 0.5
			60 sec.			$1/10^3$		80	79.2	± 1.0
			5 min.			$1/10^4$		70	69.2	± 1.0

Remarks : - UUT Microphone Model No. : 4188 & S/N : 2812705

- Mfr's Spec. : IEC 60651 Type 1 & IEC 60804 Type 1

- Uncertainties of Applied Value :

94 dB	: 31.5 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	12.5 kHz	: ± 0.70 dB
104 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	: ± 0.10 dB (Ref. 94 dB)
Burst equivalent level		: ± 0.2 dB (Ref. 110 dB continuous sound level)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C172287
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC17-0924) Date of Receipt / 收件日期 : 24 April 2017

Description / 儀器名稱 : Sound Level Meter (EQ015)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-52
Serial No. / 編號 : 00142581
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 28 April 2017

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong
Technical Officer

Certified By 核證 : K C Lee
Project Engineer

Date of Issue 簽發日期 : 2 May 2017

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C172287
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration was performed before the test.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C170048
CL281	Multifunction Acoustic Calibrator	PA160023

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	94.3	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 130	L_A	A	Fast	94.00	1	94.3 (Ref.)
				104.00		104.3
				114.00		114.3

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 130	L_A	A	Fast	94.00	1	94.3	Ref.
			Slow			94.3	± 0.3

Certificate of Calibration
校正證書

Certificate No. : C172287
證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_A	A	Fast	94.00	63 Hz	68.1	-26.2 ± 1.5
					125 Hz	78.1	-16.1 ± 1.5
					250 Hz	85.6	-8.6 ± 1.4
					500 Hz	91.0	-3.2 ± 1.4
					1 kHz	94.3	Ref.
					2 kHz	95.5	+1.2 ± 1.6
					4 kHz	95.3	+1.0 ± 1.6
					8 kHz	93.3	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.9	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Function	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 130	L_C	C	Fast	94.00	63 Hz	93.4	-0.8 ± 1.5
					125 Hz	94.1	-0.2 ± 1.5
					250 Hz	94.3	0.0 ± 1.4
					500 Hz	94.3	0.0 ± 1.4
					1 kHz	94.3	Ref.
					2 kHz	94.1	-0.2 ± 1.6
					4 kHz	93.5	-0.8 ± 1.6
					8 kHz	91.4	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.9	-6.2 (+3.0 ; -6.0)

Certificate of Calibration
校正證書

Certificate No. : C172287
證書編號

Remarks : - UUT Microphone Model No. : UC-59 & S/N : 06015

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	63 Hz - 125 Hz	: ± 0.35 dB
	250 Hz - 500 Hz	: ± 0.30 dB
	1 kHz	: ± 0.20 dB
	2 kHz - 4 kHz	: ± 0.35 dB
	8 kHz	: ± 0.45 dB
	12.5 kHz	: ± 0.70 dB
104 dB	1 kHz	: ± 0.10 dB (Ref. 94 dB)
114 dB	1 kHz	: ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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輝創工程有限公司 – 校正及檢測實驗所
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Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C172286
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC17-0924) Date of Receipt / 收件日期 : 24 April 2017

Description / 儀器名稱 : Sound Level Meter (EQ067)
Manufacturer / 製造商 : Rion
Model No. / 型號 : NL-31
Serial No. / 編號 : 00410221
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 28 April 2017

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong
Technical Officer

Certified By 核證 : K C Lee
Project Engineer

Date of Issue 簽發日期 : 2 May 2017

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c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
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Certificate of Calibration
校正證書

Certificate No. : C172286
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration was performed before the test.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C170048
CL281	Multifunction Acoustic Calibrator	PA160023

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	93.1	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 120	L_A	A	Fast	94.00	1	93.1 (Ref.)
				104.00		103.1
				114.00		113.2

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	93.1	Ref.
			Slow			93.1	± 0.3

Certificate of Calibration
校正證書

Certificate No. : C172286
證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_A	A	Fast	94.00	63 Hz	66.8	-26.2 ± 1.5
					125 Hz	76.9	-16.1 ± 1.5
					250 Hz	84.4	-8.6 ± 1.4
					500 Hz	89.8	-3.2 ± 1.4
					1 kHz	93.1	Ref.
					2 kHz	94.4	+1.2 ± 1.6
					4 kHz	94.2	+1.0 ± 1.6
					8 kHz	92.0	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.2	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_C	C	Fast	94.00	63 Hz	92.2	-0.8 ± 1.5
					125 Hz	92.9	-0.2 ± 1.5
					250 Hz	93.1	0.0 ± 1.4
					500 Hz	93.1	0.0 ± 1.4
					1 kHz	93.1	Ref.
					2 kHz	93.0	-0.2 ± 1.6
					4 kHz	92.4	-0.8 ± 1.6
					8 kHz	90.2	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.3	-6.2 (+3.0 ; -6.0)

Certificate of Calibration
校正證書

Certificate No. : C172286
證書編號

Remarks : - UUT Microphone Model No. : UC-53A & S/N : 319734

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	: 63 Hz - 125 Hz	:	± 0.35 dB
	250 Hz - 500 Hz	:	± 0.30 dB
	1 kHz	:	± 0.20 dB
	2 kHz - 4 kHz	:	± 0.35 dB
	8 kHz	:	± 0.45 dB
	12.5 kHz	:	± 0.70 dB
104 dB	: 1 kHz	:	± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	:	± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

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輝創工程有限公司 – 校正及檢測實驗所
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輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C172284
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC17-0924) Date of Receipt / 收件日期 : 24 April 2017

Description / 儀器名稱 : Acoustical Calibrator (EQ082)
Manufacturer / 製造商 : Brüel & Kjær
Model No. / 型號 : 4231
Serial No. / 編號 : 2713428
Supplied By / 委託者 : Action-United Environmental Services and Consulting
Unit A, 20/F., Gold King Industrial Building,
35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 28 April 2017

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong
Technical Officer

Certified By 核證 : K C Lee
Project Engineer

Date of Issue 簽發日期 : 2 May 2017

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C172284
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C163709
CL281	Multifunction Acoustic Calibrator	PA160023
TST150A	Measuring Amplifier	C161175

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.0	± 0.2	± 0.2
114 dB, 1 kHz	114.1		

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.000 0	1 kHz ± 0.1 %	± 0.1

Remark : The uncertainties are for a confidence probability of not less than 95 %.

Note :
Only the original copy or the laboratory's certified true copy is valid.

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輝創工程有限公司
Sun Creation Engineering Limited
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Certificate of Calibration
校正證書

Certificate No. : C172285
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC17-0924) Date of Receipt / 收件日期 : 24 April 2017

Description / 儀器名稱	:	Sound Level Calibrator (EQ088)
Manufacturer / 製造商	:	Quest
Model No. / 型號	:	QC-20
Serial No. / 編號	:	QO9090006
Supplied By / 委託者	:	Action-United Environmental Services and Consulting Unit A, 20/F., Gold King Industrial Building, 35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 28 April 2017

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong, Technical Officer

Certified By 核證 : K C Lee, Project Engineer

Date of Issue 簽發日期 : 2 May 2017

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
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輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C172285
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C163709
CL281	Multifunction Acoustic Calibrator	PA160023
TST150A	Measuring Amplifier	C161175

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.2	± 0.3	± 0.2
114 dB, 1 kHz	114.2		

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	0.991	± 2 %	± 1

Remark : - The uncertainties are for a confidence probability of not less than 95 %.

Note :
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輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C174095
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC17-0924) Date of Receipt / 收件日期 : 14 July 2017

Description / 儀器名稱	:	Sound Calibrator
Manufacturer / 製造商	:	Rion
Model No. / 型號	:	NC-74
Serial No. / 編號	:	34657231
Supplied By / 委託者	:	Action-United Environmental Services and Consulting Unit A, 20/F., Gold King Industrial Building, 35-41 Tai Lin Pai Road, Kwai Chung, N.T.

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 22 July 2017

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
The results do not exceed manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Agilent Technologies / Keysight Technologies
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA

Tested By 測試 : H T Wong, Technical Officer

Certified By 核證 : K C Lee, Engineer

Date of Issue 簽發日期 : 25 July 2017

Sun Creation Engineering Limited - Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 - 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
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輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C174095
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours before the commencement of the test.

2. The results presented are the mean of 3 measurements at each calibration point.

3. Test equipment :

Equipment ID	Description	Certificate No.
CL130	Universal Counter	C173864
CL281	Multifunction Acoustic Calibrator	PA160023
TST150A	Measuring Amplifier	C161175

4. Test procedure : MA100N.

5. Results :

5.1 Sound Level Accuracy

UUT Nominal Value	Measured Value (dB)	Mfr's Spec. (dB)	Uncertainty of Measured Value (dB)
94 dB, 1 kHz	94.1	± 0.3	± 0.2

5.2 Frequency Accuracy

UUT Nominal Value (kHz)	Measured Value (kHz)	Mfr's Spec.	Uncertainty of Measured Value (Hz)
1	1.001	1 kHz ± 1 %	± 1

Remark : The uncertainties are for a confidence probability of not less than 95 %.

Note :
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T: +852 2610 1044 | F: +852 2610 2021

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	**WORK ORDER:**	HK1777018
CLIENT:	ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	**SUB-BATCH:**	0
ADDRESS:	RM A 20/F., GOLD KING IND BLDG, NO. 35- 41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG.	**LABORATORY:**	HONG KONG
		DATE RECEIVED:	20- Nov- 2017
		DATE OF ISSUE:	27- Nov- 2017

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 principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Dissolved Oxygen and Temperature
Equipment Type:	Dissolved Oxygen Meter
Brand Name:	YSI
Model No.:	550A
Serial No.:	16A104433
Equipment No.:	- -
Date of Calibration:	24 November, 2017

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 - Inorganics

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1777018
Sub-Batch: 0
Date of Issue: 27- Nov- 2017
Client: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING

Equipment Type: Dissolved Oxygen Meter
Brand Name: YSI
Model No.: 550A
Serial No.: 16A104433
Equipment No.: - -
Date of Calibration: 24 November, 2017 Date of next Calibration: 24 February, 2018

Parameters:

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

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
7.89	8.02	+0.13
5.32	5.41	+0.09
3.52	3.69	+0.17
	Tolerance Limit (mg/L)	±0.20

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

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
9.0	9.3	+0.3
20.5	20.8	+0.3
36.0	35.2	- 0.8
	Tolerance Limit (°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
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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	**WORK ORDER:**	HK1777013
CLIENT:	ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	**SUB-BATCH:**	0
ADDRESS:	RM A 20/F., GOLDEN KING IND BLDG, NO. 35- 41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG	**LABORATORY:**	HONG KONG
		DATE RECEIVED:	20- Nov- 2017
		DATE OF ISSUE:	27- Nov- 2017

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 principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	pH
Description:	pH Meter
Brand Name:	AZ
Model No.:	8685
Serial No.:	1141943
Equipment No.:	- -
Date of Calibration:	22 November, 2017

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 - Inorganics

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1777013
Sub-batch: 0
Date of Issue: 27- Nov- 2017
Client: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING

Description: pH Meter
Brand Name: AZ
Model No.: 8685
Serial No.: 1141943
Equipment No.: - -
Date of Calibration: 22 November, 2017 Date of next Calibration: 22 February, 2018

Parameters:

pH Value

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

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	4.0	0.00
7.0	7.1	+0.10
10.0	10.0	0.00
	Tolerance Limit (pH Unit)	±0.20

Temperature

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

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
9.5	7.5	- 2.0
22.5	20.5	- 2.0
41.0	40.5	- 0.5
	Tolerance Limit (°C)	±2.0

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

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR BEN TAM	**WORK ORDER:**	HK1777014
CLIENT:	ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING	**SUB-BATCH:**	0
ADDRESS:	RM A 20/F., GOLD KING IND BLDG, NO. 35- 41 TAI LIN PAI ROAD, KWAI CHUNG, N.T., HONG KONG	**LABORATORY:**	HONG KONG
		DATE RECEIVED:	20- Nov- 2017
		DATE OF ISSUE:	27- Nov- 2017

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 principals as practised by the ALS Hong Kong laboratory or quoted from relevant international standards.

Scope of Test:	Turbidity
Equipment Type:	Turbidimeter
Brand Name:	HACH
Model No.:	2100Q
Serial No.:	11030C008499
Equipment No.:	- -
Date of Calibration:	24 November, 2017

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 - Inorganics

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1777014
Sub-batch: 0
Date of Issue: 27- Nov- 2017
Client: ACTION UNITED ENVIRONMENT SERVICES AND CONSULTING

Equipment Type: Turbidimeter
Brand Name: HACH
Model No.: 2100Q
Serial No.: 11030C008499
Equipment No.: - -
Date of Calibration: 24 November, 2017 Date of next Calibration: 24 February, 2018

Parameters:

Turbidity **Method Ref: APHA 21st Ed. 2130B**

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.35	- -
4	4.32	+8.0
40	42.5	+6.3
80	82.0	+2.5
400	383	- 4.3
800	792	- 1.0
	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 - Inorganics

Appendix G

Event and Action Plan

Event and Action Plan for Air Quality

Event	ET	IEC	ER	Action Contractor
Action Level				
1. Exceedance for one sample	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.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	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.	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. Monitor the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.
Limit Level				
1. Exceedance for one sample	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.	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. Monitor theimplementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	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.
2. Exceedance for two or more consecutive samples	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.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 4. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 5. Monitor the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation 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.	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.

Event and Action Plan for Construction Noise

Event	ET	IEC	ER	Action Contractor
Action Level	1. Notify ER, IEC and Contractor; 2. Carry out investigation; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the IEC and Contractor on remedial measures required; 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the investigation results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Advise the ER on the effectiveness of the proposed remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures.	1. Submit noise mitigation proposals to IEC and ER; 2. Implement noise mitigation proposals.
Limit Level	1. Inform IEC, ER, Contractor and EPD; 2. Repeat measurements to confirm findings; 3. Increase monitoring frequency; 4. Identify source and investigate the cause of exceedance; 5. Carry out analysis of Contractor's working procedures; 6. Discuss with the IEC, Contractor and ER on remedial measures required; 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.	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.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consolidation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Supervise the implementation of remedial measures; 5. If exceedance continues, consider stopping the Contractor to continue working on that portion of work which causes the exceedance until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC and ER within 3 working days of notification; 3. Implement the agreed proposals; 4. Submit further proposal if problem still not under control; 5. Stop the relevant portion of works as instructed by the ER until the exceedance is abated.

Event and Action Plan for Water Quality

EVENT	ACTION			
	ET	IEC	ER	CONTRACTOR
Action level being exceeded by one sampling day	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures	1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER; 6. Implement the agreed mitigation measures.
Action Level being exceeded by more than two consecutive sampling days	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC and Contractor; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC and Contractor; 6. Ensure mitigation measures are implemented; 7. Prepare to increase the monitoring frequency to daily; 8. Repeat measurement on next day of exceedance.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures	1. Discuss with IEC on the proposed mitigation measures; 2. Make agreement on the mitigation measures to be implemented; 3. Assess the effectiveness of the implemented mitigation measures	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET and IEC and propose mitigation measures to IEC and ER within 2 working days; 6. Implement the agreed mitigation measures.
Limit Level being exceeded by one sampling day	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC, Contractor and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures.
Limit level being exceeded by more than one consecutive sampling days	1. Repeat in-situ measurement to confirm findings; 2. Identify reasons for non-compliance and sources of impact; 3. Inform IEC, Contractor and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit Level for two consecutive days.	1. Discuss with ET and Contractor on the mitigation measures; 2. Review proposals on mitigation measures submitted by Contractor and advise the ER accordingly; 3. Assess the effectiveness of the implemented mitigation measures.	1. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 2. Request Contractor to critically review the working methods; 3. Make agreement on the mitigation measures to be implemented; 4. Assess the effectiveness of the implemented mitigation measures; 5. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit Level.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment; 4. Consider changes of working methods; 5. Discuss with ET, IEC and ER and propose mitigation measures to IEC and ER within 3 working days; 6. Implement the agreed mitigation measures; 7. As directed by the ER, to slow down or to stop all or part of the construction activities.

Appendix H

Impact Monitoring Schedule

Impact Monitoring Schedule for Reporting Period – January 2018

Date		Dust Monitoring		Noise Monitoring	Water Quality
		1-hour TSP	24-hour TSP		
Mon	1-Jan-18		AM1b, AM2, AM3 & AM9b		
Tue	2-Jan-18	AM1b, AM2, AM3 & AM9b	AM4b, AM5, AM6, AM7b & AM8	NM1, NM2a, NM8, NM9 & NM10	All Water Quality Monitoring Locations
Wed	3-Jan-18				
Thu	4-Jan-18	AM4b, AM5, AM6, AM7b & AM8		NM3, NM4, NM5, NM6 & NM7	All Water Quality Monitoring Locations
Fri	5-Jan-18				
Sat	6-Jan-18		AM1b, AM2, AM3 & AM9b		All Water Quality Monitoring Locations
Sun	7-Jan-18				
Mon	8-Jan-18	AM1b, AM2, AM3 & AM9b	AM4b, AM5, AM6, AM7b & AM8	NM1, NM2a, NM8, NM9 & NM10	All Water Quality Monitoring Locations
Tue	9-Jan-18				
Wed	10-Jan-18	AM4b, AM5, AM6, AM7b & AM8		NM3, NM4, NM5, NM6 & NM7	All Water Quality Monitoring Locations
Thu	11-Jan-18				
Fri	12-Jan-18		AM1b, AM2, AM3 & AM9b		
Sat	13-Jan-18	AM1b, AM2, AM3 & AM9b	AM4b, AM5, AM6, AM7b & AM8		All Water Quality Monitoring Locations
Sun	14-Jan-18				
Mon	15-Jan-18				
Tue	16-Jan-18	AM4b, AM5, AM6, AM7b & AM8		NM3, NM4, NM5, NM6 & NM7	All Water Quality Monitoring Locations
Wed	17-Jan-18				
Thu	18-Jan-18		AM1b, AM2, AM3 & AM9b		All Water Quality Monitoring Locations
Fri	19-Jan-18	AM1b, AM2, AM3 & AM9b	AM4b, AM5, AM6, AM7b & AM8	NM1, NM2a, NM8, NM9 & NM10	
Sat	20-Jan-18				All Water Quality Monitoring Locations
Sun	21-Jan-18				
Mon	22-Jan-18	AM4b, AM5, AM6, AM7b & AM8		NM3, NM4, NM5, NM6 & NM7	All Water Quality Monitoring Locations
Tue	23-Jan-18				
Wed	24-Jan-18		AM1b, AM2, AM3 & AM9b		All Water Quality Monitoring Locations
Thu	25-Jan-18	AM1b, AM2, AM3 & AM9b	AM4b, AM5, AM6, AM7b & AM8	NM1, NM2a, NM8, NM9 & NM10	
Fri	26-Jan-18				
Sat	27-Jan-18	AM4b, AM5, AM6, AM7b & AM8			All Water Quality Monitoring Locations
Sun	28-Jan-18				
Mon	29-Jan-18				All Water Quality Monitoring Locations
Tue	30-Jan-18		AM1b, AM2, AM3 & AM9b		
Wed	31-Jan-18	AM1b, AM2, AM3 & AM9b	AM4b, AM5, AM6, AM7b & AM8	NM1, NM2a, NM8, NM9 & NM10	All Water Quality Monitoring Locations

	Monitoring Day
	Sunday or Public Holiday

Impact Monitoring Schedule for next Reporting Period – February 2018

Date		Dust Monitoring		Noise Monitoring	Water Quality
		1-hour TSP	24-hour TSP		
Thu	1-Feb-18				
Fri	2-Feb-18	AM4b, AM5, AM6, AM7b & AM8		NM3, NM4, NM5, NM6 & NM7	All Water Quality Monitoring Locations
Sat	3-Feb-18				
Sun	4-Feb-18				
Mon	5-Feb-18		AM1b, AM2, AM3 & AM9b		All Water Quality Monitoring Locations
Tue	6-Feb-18	AM1b, AM2, AM3 & AM9b	AM4b, AM5, AM6, AM7b & AM8	NM1, NM2a, NM8, NM9 & NM10	
Wed	7-Feb-18				All Water Quality Monitoring Locations
Thu	8-Feb-18	AM4b, AM5, AM6, AM7b & AM8		NM3, NM4, NM5, NM6 & NM7	
Fri	9-Feb-18				All Water Quality Monitoring Locations
Sat	10-Feb-18	AM1b, AM2, AM3 & AM9b	AM1b, AM2, AM3 & AM9b		
Sun	11-Feb-18				
Mon	12-Feb-18		AM4b, AM5, AM6, AM7b & AM8		All Water Quality Monitoring Locations
Tue	13-Feb-18				
Wed	14-Feb-18	AM4b, AM5, AM6, AM7b & AM8		NM3, NM4, NM5, NM6 & NM7	All Water Quality Monitoring Locations
Thu	15-Feb-18	AM1b, AM2, AM3 & AM9b		NM1, NM2a, NM8, NM9 & NM10	
Fri	16-Feb-18		AM1b, AM2, AM3 & AM9b		
Sat	17-Feb-18		AM4b, AM5, AM6, AM7b & AM8		(#) WM3x, WM3-C, WM4, WM4-CB, WM4-CB
Sun	18-Feb-18				
Mon	19-Feb-18				
Tue	20-Feb-18	AM4b, AM5, AM6, AM7b & AM8		NM3, NM4, NM5, NM6 & NM7	All Water Quality Monitoring Locations
Wed	21-Feb-18	AM1b, AM2, AM3 & AM9b		NM1, NM2a, NM8, NM9 & NM10	
Thu	22-Feb-18		AM1b, AM2, AM3 & AM9b		All Water Quality Monitoring Locations
Fri	23-Feb-18		AM4b, AM5, AM6, AM7b & AM8		
Sat	24-Feb-18				All Water Quality Monitoring Locations
Sun	25-Feb-18				
Mon	26-Feb-18	AM4b, AM5, AM6, AM7b & AM8		NM3, NM4, NM5, NM6 & NM7	
Tue	27-Feb-18	AM1b, AM2, AM3 & AM9b		NM1, NM2a, NM8, NM9 & NM10	All Water Quality Monitoring Locations
Wed	28-Feb-18		AM1b, AM2, AM3 & AM9b		

Remark: (#) During Chinese New Year holiday, there will be construction activities carried out at site area of Contract 2 and Contract 3. Therefore, water quality monitoring will be carried out at the related stations.

	Monitoring Day
	Sunday or Public Holiday

Appendix I

Database of Monitoring Result

24-hour TSP Monitoring Data

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-HR TSP ($\mu g/m^3$)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(℃)	(hPa)	(m^3/min)	(std m^3)	INITIAL	FINAL	(g)	
AM1b – Open Area, Tsung Yuen Ha Village															
1-Jan-18	22025	14053.78	14077.97	1451.40	36	36	36.0	17.3	1020.5	1.24	1803	2.5618	2.8078	0.2460	136
6-Jan-18	22044	14077.97	14102.11	1448.40	36	36	36.0	16.2	1014.6	1.24	1798	2.6170	2.6594	0.0424	24
12-Jan-18	22088	14102.11	14126.27	1449.60	39	39	39.0	12.8	1027.1	1.36	1966	2.6579	2.8005	0.1426	73
18-Jan-18	22101	14126.27	14150.40	1447.80	36	36	36.0	19.2	1016.6	1.24	1790	2.6480	2.7872	0.1392	78
24-Jan-18	22127	14150.40	14174.55	1449.00	35	35	35.0	15.7	1020.1	1.21	1757	2.6468	2.8331	0.1863	106
30-Jan-18	22117	14174.55	14198.70	1449.00	36	36	36.0	10.1	1020.4	1.26	1822	2.6815	2.7936	0.1121	62
AM2 - Village House near Lin Ma Hang Road															
1-Jan-18	22026	9544.55	9568.34	1427.40	38	38	38.0	17.3	1020.5	1.19	1696	2.5550	2.8032	0.2482	146
6-Jan-18	22046	9568.34	9592.17	1429.80	36	36	36.0	16.2	1014.6	1.12	1601	2.5810	2.6479	0.0669	42
12-Jan-18	22087	9592.17	9615.97	1428.00	40	40	40.0	12.8	1027.1	1.27	1814	2.6357	2.8690	0.2333	129
18-Jan-18	22100	9615.97	9639.78	1428.60	40	42	41.0	19.2	1016.6	1.28	1832	2.6210	2.8902	0.2692	147
24-Jan-18	22126	9639.78	9663.56	1426.80	40	40	40.0	15.7	1020.1	1.26	1796	2.6400	2.8950	0.2550	142
30-Jan-18	22118	9663.56	9687.36	1428.00	36	36	36.0	10.1	1020.4	1.14	1622	2.6633	2.7993	0.1360	84
AM3 - Ta Kwu Ling Fire Service Station of Ta Kwu Ling Village															
1-Jan-18	22043	10677.30	10701.30	1440.00	36	36	36.0	17.3	1020.5	1.10	1591	2.5577	2.6924	0.1347	85
6-Jan-18	22047	10701.30	10725.30	1440.00	36	36	36.0	16.2	1014.6	1.10	1589	2.5931	2.6269	0.0338	21
12-Jan-18	22086	10725.30	10749.30	1440.00	36	36	36.0	12.8	1027.1	1.12	1610	2.6388	2.7656	0.1268	79
18-Jan-18	22102	10749.30	10773.30	1440.00	36	36	36.0	19.2	1016.6	1.10	1582	2.6245	2.7779	0.1534	97
24-Jan-18	22128	10773.30	10797.30	1440.00	36	36	36.0	15.7	1020.1	1.11	1595	2.6333	2.7649	0.1316	83
30-Jan-18	22119	10797.30	10821.30	1440.00	36	36	36.0	10.1	1020.4	1.12	1612	2.6370	2.7871	0.1501	93
AM4b - House no. 10B1 Nga Yiu Ha Village															
2-Jan-18	22029	12679.84	12703.84	1440.00	42	42	42.0	17.8	1019.3	1.09	1570	2.5485	2.7715	0.2230	142
8-Jan-18	22048	12703.84	12727.84	1440.00	36	36	36.0	15.1	1015.2	0.91	1310	2.5656	2.6060	0.0404	31
13-Jan-18	22095	12727.84	12751.85	1440.60	43	44	43.5	12.9	1026	1.15	1659	2.6203	2.7356	0.1153	69
19-Jan-18	22124	12751.85	12775.85	1440.00	44	44	44.0	18.6	1017.8	1.15	1654	2.6712	2.7985	0.1273	77
25-Jan-18	22152	12775.85	12799.85	1440.00	45	45	45.0	17.2	1015.7	1.18	1700	2.6428	2.7710	0.1282	75
31-Jan-18	22158	12799.85	12823.85	1440.00	44	44	44.0	9.4	1021	1.17	1688	2.6951	2.7344	0.0393	23
AM5a - Ping Yeung Village House															
2-Jan-18	22030	14352.02	14375.84	1429.20	30	30	30.0	17.8	1019.3	1.01	1443	2.5547	2.6790	0.1243	86
8-Jan-18	22049	14375.84	14399.87	1441.80	28	28	28.0	15.1	1015.2	0.96	1387	2.5740	2.5905	0.0165	12

DATE	SAMPLE NUMBER	ELAPSED TIME			CHART READING			AVG TEMP	AVG AIR PRESS	STANDARD FLOW RATE	AIR VOLUME	FILTER WEIGHT (g)		DUST WEIGHT COLLECTED	24-HR TSP (μg/m³)
		INITIAL	FINAL	(min)	MIN	MAX	AVG	(℃)	(hPa)	(m³/min)	(std m³)	INITIAL	FINAL	(g)	
13-Jan-18	22096	14399.87	14423.89	1441.20	30	30	30.0	12.9	1026	1.02	1467	2.6175	2.6498	0.0323	22
19-Jan-18	22123	14423.89	14447.92	1441.80	30	30	30.0	18.6	1017.8	1.01	1453	2.6712	2.7993	0.1281	88
25-Jan-18	22153	14447.92	14471.92	1440.00	32	32	32.0	17.2	1015.7	1.06	1524	2.6485	2.8403	0.1918	126
31-Jan-18	22155	11619.31	11643.66	1461.00	40	40	40.0	9.4	1021	1.27	1857	2.6940	2.7680	0.0740	40
AM6 - Wo Keng Shan Village House															
2-Jan-18	22031	9109.47	9133.47	1440.00	42	42	42.0	17.8	1019.3	1.30	1866	2.5701	2.7795	0.2094	112
8-Jan-18	22050	9133.47	9157.47	1440.00	40	40	40.0	15.1	1015.2	1.25	1793	2.5819	2.6205	0.0386	22
13-Jan-18	22097	9157.47	9181.47	1440.00	40	40	40.0	12.9	1026.0	1.25	1807	2.6343	2.8225	0.1882	104
19-Jan-18	22122	9181.47	9205.48	1440.60	38	38	38.0	18.6	1017.8	1.19	1710	2.6150	2.7126	0.0976	57
25-Jan-18	22151	9205.48	9229.48	1440.00	31	31	31.0	17.2	1015.7	1.00	1442	2.6485	2.7916	0.1431	99
31-Jan-18	22157	9229.48	9253.48	1440.00	30	30	30.0	9.4	1021.0	0.99	1422	2.6949	2.7504	0.0555	39
AM7b - Loi Tung Village House															
2-Jan-18	22032	18156.68	18180.68	1440.00	46	46	46.0	17.8	1019.3	1.25	1806	2.5762	2.8529	0.2767	153
8-Jan-18	22051	18180.68	18204.68	1440.00	42	42	42.0	15.1	1015.2	1.13	1626	2.5674	2.6050	0.0376	23
13-Jan-18	22098	18204.68	18228.68	1440.00	42	42	42.0	12.9	1026	1.14	1644	2.6108	2.7992	0.1884	115
19-Jan-18	22121	18228.68	18252.68	1440.00	46	46	46.0	18.6	1017.8	1.25	1801	2.6171	2.8071	0.1900	105
25-Jan-18	22150	18252.68	18276.68	1440.00	50	50	50.0	17.2	1015.7	1.38	1989	2.6444	2.9362	0.2918	147
31-Jan-18	22156	18276.68	18300.72	1442.40	46	46	46.0	9.4	1021	1.28	1842	2.6794	2.7673	0.0879	48
AM8 - Po Kat Tsai Village No. 4															
2-Jan-18	22042	12053.71	12077.71	1440.00	32	32	32.0	17.8	1019.3	1.10	1581	2.5593	2.7432	0.1839	116
8-Jan-18	22081	12077.71	12101.71	1440.00	38	38	38.0	15.1	1015.2	1.23	1767	2.6200	2.6532	0.0332	19
13-Jan-18	22099	12101.71	12125.71	1440.00	36	36	36.0	12.9	1026	1.19	1716	2.6314	2.7464	0.1150	67
19-Jan-18	22104	12125.71	12149.72	1440.60	34	34	34.0	18.36	1017.8	1.14	1641	2.6293	2.7120	0.0827	50
25-Jan-18	22154	12149.72	12173.72	1440.00	32	32	32.0	17.2	1015.7	1.10	1580	2.6660	2.7216	0.0556	35
31-Jan-18	22159	12173.72	12197.72	1440.00	30	30	30.0	9.4	1021	1.07	1534	2.6893	2.7388	0.0495	32
AM9b - Nam Wa Po Village House No. 80															
1-Jan-18	22027	19432.60	19456.50	1434.00	42	42	42.0	17.3	1020.5	1.33	1909	2.5662	2.8400	0.2738	143
6-Jan-18	22045	19456.50	19480.50	1440.00	38	38	38.0	16.2	1014.6	1.20	1734	2.5688	2.6855	0.1167	67
12-Jan-18	22089	19480.50	19504.50	1440.00	38	38	38.0	12.8	1027.1	1.22	1755	2.6355	2.7230	0.0875	50
18-Jan-18	22103	19504.50	19528.51	1440.60	36	36	36.0	19.2	1016.6	1.14	1637	2.6712	2.7194	0.0482	29
24-Jan-18	22129	19528.51	19552.51	1440.00	35	35	35.0	15.7	1020.1	1.11	1604	2.6403	2.8309	0.1906	119
30-Jan-18	22120	19552.51	19576.51	1440.00	32	32	32.0	10.1	1020.4	1.03	1482	2.6309	2.7340	0.1031	70

Construction Noise Monitoring Results, dB(A)

Date	Start Time	1st Leq5min	L10	L90	2nd Leq5min	L10	L90	3nd Leq5min	L10	L90	4th Leq5min	L10	L90	5th Leq5min	L10	L90	6th Leq5min	L10	L90	Leq30	façade correction
NM1 - Tsung Yuen Ha Village House No. 63																					
2-Jan-18	9:38	57.1	59.0	53.9	57.2	59.2	53.9	57.3	58.7	54.6	57.2	58.7	54.1	60.3	62.2	54.5	60.9	64.5	53.9	59	NA
8-Jan-18	13:28	60.3	61.2	55.3	58.3	59.0	55.0	61.8	63.5	57.2	60.5	62.1	56.8	62.7	64.5	56.7	60.4	62.1	57.1	61	NA
19-Jan-18	10:41	57.7	59.9	53.7	56.0	57.9	51.3	55.7	57.1	54.1	57.9	60.8	54.4	55.1	56.7	53.0	55.6	57.0	53.5	56	NA
25-Jan-18	10:08	49.5	51.3	42.8	44.5	46.9	42.3	45.2	47.0	43.5	44.4	46.5	42.4	43.9	44.9	42.5	44.5	45.5	42.5	46	NA
31-Jan-18	9:36	57.3	59.7	54.0	57.7	59.5	54.4	58.3	60.6	55.6	57.2	60.9	55.6	58.2	61.2	55.6	60.4	63.5	56.0	58	
NM2a - Village House near Lin Ma Hang Road																					
2-Jan-18	9:33	73.8	74.4	63.6	69.7	73.0	64.5	69.9	73.5	64.1	70.2	73.1	66.1	69.4	72.4	63.8	67.3	70.4	59.1	71	74
8-Jan-18	14:09	70.3	73.1	62.3	64.8	65.7	59.9	63.5	65.2	60.5	64.3	64.6	59.7	62.2	63.5	59.7	62.3	64.5	60.5	66	69
19-Jan-18	10:06	65.3	68.3	60.0	62.4	64.2	59.8	64.2	66.1	60.2	62.5	64.9	56.7	65.4	67.1	63.3	63.2	64.9	60.3	64	67
25-Jan-18	10:46	71.5	66.6	51.8	68.0	75.0	49.0	61.0	64.8	49.6	59.0	62.8	49.7	60.3	62.2	51.0	61.8	67.1	49.7	66	69
31-Jan-18	10:16	70.6	70.1	54.3	64.9	67.1	54.6	63.4	65.7	52.5	61.5	63.2	51.9	62.7	64.4	52.2	63.6	65.0	53.2	66	69
NM3 - Ping Yeung Village House																					
4-Jan-18	9:15	64.3	65.3	52.8	63.7	64.3	53.9	62.2	63.1	52.8	58.8	61.7	51.9	60.4	62.3	52.5	61.8	62.4	53.6	62	NA
10-Jan-18	10:18	62.1	64.5	51.8	57.3	59.5	52.2	57.8	61.0	52.2	54.3	56.1	50.9	57.5	58.6	51.5	57.6	58.7	50.8	58	NA
16-Jan-18	9:36	64.7	62.3	51.1	65.7	63.4	52.7	62.4	61.3	52.1	60.6	62.4	53.2	55.5	55.8	53.4	60.7	61.7	52.5	63	NA
22-Jan-18	9:21	64.2	65.8	52.6	64.7	65.9	53.8	63.1	64.6	53.1	60.2	62.4	51.4	61.7	63.6	51.9	62.8	66.4	52.5	63	NA
NM4 - Wo Keng Shan Village House																					
4-Jan-18	10:23	64.8	65.2	53.4	63.9	63.2	55.8	62.7	61.4	52.9	63.3	64.7	51.8	63.9	62.8	52.4	62.3	62.9	52.6	64	NA
10-Jan-18	10:06	63.2	66.2	53.0	56.3	57.9	49.6	64.5	62.6	50.5	63.4	61.7	51.6	70.7	72.2	52.6	73.2	67.4	50.3	68	NA
16-Jan-18	10:18	62.8	61.2	53.0	64.5	63.6	54.4	60.9	58.9	52.1	65.6	64.5	53.7	65.5	62.2	51.4	63.2	60.4	51.4	64	NA
22-Jan-18	10:08	63.3	65.8	53.9	64.4	66.7	54.8	63.3	64.2	52.8	61.4	63.7	51.1	62.8	65.9	52.4	62.4	65.3	52.6	63	NA
NM5– Ping Yeung Village House																					
4-Jan-18	11:08	52.6	55.8	48.2	51.7	54.6	48.3	52.4	55.9	48.1	54.7	56.8	47.3	53.9	54.2	47.8	53.5	55.6	47.2	53	NA
10-Jan-18	9:27	53.4	55.4	50.3	52.7	55.2	47.6	51.6	54.8	46.7	51.9	54.2	48.2	57.1	61.3	48.8	52.8	55.7	48.0	54	NA
16-Jan-18	10:54	51.6	53.4	47.0	51.8	53.2	47.7	49.1	51.7	45.1	50.5	53.5	45.1	50.6	53.6	47.1	49.6	52.6	44.4	51	NA
22-Jan-18	10:46	52.4	55.8	48.2	53.7	55.9	48.3	53.1	56.6	48.1	54.7	56.9	47.2	52.8	55.3	47.5	53.4	55.2	47.4	53	NA
NM6 – Tai Tong Wu Village House 2																					
4-Jan-18	13:04	57.3	62.8	53.4	58.6	62.2	53.9	59.4	61.8	52.4	57.3	60.3	52.9	58.8	61.7	52.4	57.6	60.3	51.6	58	NA
10-Jan-18	9:23	58.2	61.3	46.6	57.8	61.7	46.6	58.4	61.1	52.4	56.2	59.5	48.5	61.2	64.7	54.4	63.1	66.3	55.8	60	NA
16-Jan-18	11:27	58.8	61.4	52.6	52.4	60.8	49.5	58.5	61.5	49.9	59.8	62.3	50.0	58.8	61.5	51.5	57.4	60.6	50.1	58	NA
22-Jan-18	11:28	57.4	61.7	52.6	58.3	62.4	53.6	57.9	62.5	53.4	57.1	63.3	50.4	58.2	63.5	51.2	59.7	62.3	51.9	58	NA
NM7 – Po Kat Tsai Village																					

Date	Start Time	1st Leq_{5min}	L10	L90	2nd Leq_{5min}	L10	L90	3rd Leq_{5min}	L10	L90	4th Leq_{5min}	L10	L90	5th Leq_{5min}	L10	L90	6th Leq_{5min}	L10	L90	Leq30	façade correction
4-Jan-18	13:59	60.4	61.9	54.3	57.1	58.9	54.2	58.3	60.2	54.1	59.9	61.7	55.3	58.4	61.6	54.1	60.2	62.6	54.8	59	NA
10-Jan-18	11:40	57.0	60.2	51.2	55.6	57.6	50.9	54.9	57.6	50.4	58.7	61.8	50.8	56.4	59.6	50.5	56.8	59.5	52.3	57	NA
16-Jan-18	13:22	57.3	58.5	51.6	60.8	60.8	52.6	61.5	61.4	50.9	60.7	60.1	49.4	58.6	59.7	50.9	61.9	62.5	51.4	60	NA
22-Jan-18	13:21	59.7	62.4	53.6	58.2	59.7	53.4	57.6	59.2	54.3	58.2	60.4	53.6	60.4	62.6	54.3	60.9	63.8	55.7	59	NA
NM8 - Village House, Tong Hang																					
2-Jan-18	11:16	66.2	67	54.5	63.3	66.5	54.5	62.2	65.5	52.5	61.7	64.5	53.5	61.8	65	52	60.3	64.5	51	63	NA
8-Jan-18	1:52	68.3	70	60	63.5	66	59	63.4	66	58.5	60.1	61.5	58	61.1	63	58.5	63.8	66	57.5	64	NA
19-Jan-18	11:03	61.7	66.3	50.2	59.5	65.2	51.9	61.7	67.2	52.8	63.7	68.3	51.9	62.2	67.1	50.6	61.5	66.1	50.5	62	NA
25-Jan-18	11:25	57.5	60	47	59.8	66	47	56	50.5	47	58	52	46	59.1	64	46.5	54.6	55.5	47.5	58	NA
31-Jan-18	11:13	54.7	56.5	51	56.1	57.5	51.5	54.8	56.5	52	56.2	58.5	51	58.4	59	51	55.7	58	51	56	NA
NM9 - Village House, Kiu Tau Village																					
2-Jan-18	10:13	66.8	69.0	53.5	62.5	66.0	50.5	58.7	63.5	51.5	66.5	65.5	50.0	61.3	64.5	49.0	65.7	66.5	50.5	64	NA
8-Jan-18	14:00	76.4	78.5	63.5	67	68.5	63.5	66.1	67	64.5	65.9	67	63.5	65.5	67	63.5	65.5	66.5	64.0	70	NA
19-Jan-18	10:10	61.6	62.1	58.7	62.8	63.7	59.6	63.9	64.4	60.9	62.6	63.1	59.5	63.1	64.5	59.9	62.1	63.2	58.8	63	NA
25-Jan-18	10:43	60.2	61.0	52.0	58.3	62.5	52.5	58.7	56.0	51.5	57.6	59.0	51.5	56.8	56.5	51.0	59.0	63.0	51.5	59	NA
31-Jan-18	10:18	56.9	59.0	52.0	61.6	63.0	53.0	76.5	73.0	55.5	61.4	63.0	54.0	60.0	62.5	52.5	58.4	61.5	52.0	69	NA
NM10 - Nam Wa Po Village House No. 80																					
2-Jan-18	9:18	64.9	68.0	56.5	64.1	67.0	56.0	65.0	67.5	54.5	60.4	63.5	55.0	66.3	68.5	56.0	62.4	66.5	56.5	64	67
8-Jan-18	13:08	62.3	64.0	59.0	63.1	65.0	60.0	64.2	65.5	61.0	63.8	66.0	59.5	61.8	63.5	59.5	64.6	67.5	59.0	63	66
19-Jan-18	9:22	61.6	63.2	59.6	61.0	63.7	59.8	62.1	64.4	60.9	63.7	65.8	61.1	62.5	64.1	60.1	62.6	63.7	59.1	62	65
25-Jan-18	10:00	57.8	59.5	54.5	57.7	59.5	55.5	57.9	59.0	56.5	57.6	58.5	56.0	58.6	61.0	55.0	58.2	60.0	55.5	58	61
31-Jan-18	9:26	65.9	69.5	59.0	61.5	64.0	57.0	62.0	64.0	58.5	62.5	65.0	59.0	62.1	63.5	59.0	61.7	63.5	57.5	63	66

Water Quality Monitoring Data for Contract 6 and SS C505

Date	2-Jan-18													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	10:05	0.34	19.4	19.4	8.6	8.6	95.5	95.4	7.4	7.5	8.3	8.3	5	4.5
			19.4		8.5		95.2		7.6		8.3		4	
WM1	10:14	0.20	18.8	18.8	10.25	10.2	112.2	111.9	5.7	5.4	8.1	8.1	3	3.5
			18.8		10.15		111.5		5.1		8.1		4	

Date	4-Jan-18													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	10:05	0.34	23	23.0	7.9	7.9	90.6	90.8	20.8	20.3	8	8.0	20	19.5
			23		7.94		90.9		19.8		8		19	
WM1	10:15	0.20	22.1	22.1	10.5	10.5	116.7	116.3	5.3	5.2	8	8.0	<2	<2
			22.1		10.5		115.8		5.2		8		<2	

Date	6-Jan-18													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	8:51	0.37	19.4	19.4	10.41	10.5	112.0	112.9	12.8	12.9	8.1	8.1	9	8.0
			19.4		10.57		113.8		12.9		8.1		7	
WM1	9:03	0.14	18.9	18.9	9.87	9.9	105.5	106.1	6.8	6.8	8	8.0	3	2.5
			18.9		9.91		106.7		6.8		8		2	

Date	8-Jan-18													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	10:45	0.34	19.9	19.9	8.28	8.3	90.3	90.1	24.8	25.5	7.7	7.7	22	21.0
			19.9		8.25		89.9		26.2		7.7		20	
WM1	10:37	0.20	20.1	20.1	8.01	8.0	87.8	87.8	40.1	39.7	7.6	7.6	25	24.5
			20.1		8		87.7		39.3		7.6		24	

Date	10-Jan-18													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	11:30	0.34	18.4	18.4	6.56	6.6	70.3	70.4	42.9	43.3	8.1	8.1	19	20.0
			18.4		6.57		70.4		43.7		8.1		21	
WM1	11:45	0.20	18.4	18.4	8.8	8.8	91.8	91.8	51.0	51.1	8.2	8.2	36	35.0
			18.4		8.89		91.8		51.1		8.2		34	

Date	13-Jan-18													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	8:47	0.37	12.4	12.4	11.79	11.8	105.7	106.2	13.2	13.2	8.4	8.4	5	5.0
			12.4		11.81		106.7		13.2		8.4		5	
WM1	8:59	0.18	10.9	10.9	12.85	12.9	114.9	115.1	42.1	42.8	8	8.0	33	33.5
			10.9		12.89		115.2		43.4		8		34	

Date	16-Jan-18													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	10:00	0.34	22.3	22.3	8.17	8.2	92.0	92.0	21.6	21.4	7.9	7.9	17	17.0
			22.3		8.18		92.0		21.1		7.9		17	
WM1	10:08	0.13	22.5	22.5	6.98	7.0	79.3	79.6	14.8	14.4	7.9	7.9	9	9.5
			22.5		7.02		79.8		13.9		7.9		10	

Date	18-Jan-18													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	9:40	0.34	20.8	20.8	7.95	8.0	87.6	87.9	43.0	41.3	7.8	7.8	33	32.5
			20.8		8.01		88.1		39.6		7.8		32	
WM1	9:50	0.15	18	18.0	9.43	9.4	101.2	101.1	20.6	18.5	7.8	7.8	19	18.0
			18		9.4		101.0		16.4		7.8		17	

Date	20-Jan-18													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	10:24	0.31	18.7	18.7	6.31	6.3	67.2	67.7	18.6	18.8	8	8.0	18	18.0
			18.7		6.35		68.1		18.9		8		18	
WM1	10:11	0.17	18.6	18.7	8.67	8.7	92.1	92.4	10.5	10.6	8.1	8.1	9	9.5
			18.7		8.69		92.7		10.7		8.1		10	

Date	22-Jan-18													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM1-C	11:20	0.34	25.1	25.1	4.14	4.2	50.1	50.2	20.9	20.7	7.6	7.6	20	19.0
			25.1		4.17		50.3		20.4		7.6		18	
WM1	11:10	0.15	24.5	24.5	5.62	5.6	67.2	67.4	14.0	14.0	7.7	7.7	9	9.0
			24.5		5.66		67.6		14.0		7.7		9	

Date	24-Jan-18													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	9:45	0.34	20.6	20.6	7.37	7.4	80.6	80.8	59.9	60.5	7.6	7.6	49	49.0
			20.6		7.4		80.9		61.0		7.6		49	
WM1	9:30	0.15	22	22.0	9.97	10.0	110.0	110.2	14.0	13.9	7.6	7.6	9	9.0
			22		9.99		110.3		13.7		7.6		9	

Date	27-Jan-18													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	9:37	0.37	18.3	18.3	8.3	8.3	87.1	87.8	33.9	34.0	7.9	7.9	30	30.0
			18.3		8.35		88.4		34.1		7.9		30	
WM1	9:21	0.15	17.3	17.3	11.15	11.2	116.1	116.4	10.0	10.0	8.1	8.1	5	4.5
			17.3		11.2		116.7		10.1		8.1		4	

Date	29-Jan-18													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	9:50	0.34	13.1	13.1	12.31	12.4	115.5	115.9	10.1	9.7	7.8	7.8	6	5.5
			13.1		12.44		116.2		9.3		7.8		5	
WM1	9:35	0.15	14.4	14.4	15.13	15.1	144.2	144.1	8.7	8.9	7.9	7.9	4	4.0
			14.4		15.1		144.0		9.2		7.9		4	

Date	31-Jan-18													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM1-C	9:45	0.34	10.6	10.6	15.26	15.2	134.7	134.4	65.6	66.0	7.8	7.8	56	54.0
			10.6		15.17		134.1		66.3		7.8		52	
WM1	9:55	0.18	10.4	10.4	13.68	13.7	121.2	121.2	75.0	74.8	7.5	7.5	66	64.0
			10.4		13.67		121.1		74.5		7.5		62	

Water Quality Monitoring Data for Contract 2 and 3

Date	2-Jan-18															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	11:40	0.13	22.2	22.2	9.02	9.0	102.6	102.7	6.0	5.3	8.2	8.2	10	11.0
			22.2		9.07		102.8		4.7		8.2		12	
WM4-CB	11:50	0.31	21.9	21.9	8.13	8.1	91.9	91.7	7.5	7.8	8	8.0	4	4.5
			21.9		8.09		91.5		8.1		8		5	
WM4	11:35	0.15	21	21.0	8.54	8.5	95.2	95.1	9.3	8.2	8	8.0	10	10.5
			21		8.5		94.9		7.2		8		11	

Date	4-Jan-18															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	11:48	0.13	21.9	21.9	9.32	9.3	105.9	105.9	3.4	3.2	8.2	8.2	<2	<2
			21.9		9.3		105.8		3.0		8.2		<2	
WM4-CB	12:00	0.31	22.6	22.6	5.54	5.6	63.4	63.6	19.9	19.8	7.8	7.8	19	20.0
			22.6		5.56		63.7		19.6		7.8		21	
WM4	11:40	0.15	22	22.0	6.73	6.8	76.5	76.8	6.0	6.0	8.1	8.1	4	4.0
			22		6.79		77.1		6.0		8.1		4	

Date	6-Jan-18															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	10:49	0.24	18.2	18.2	8.95	9.0	94.3	95.0	7.2	7.2	8.4	8.4	2	2.5
			18.2		8.99		95.7		7.2		8.4		3	
WM4-CB	11:01	0.41	17.9	17.9	6.44	6.5	67.5	67.8	14.6	14.8	8.2	8.2	10	10.5
			17.9		6.47		68.1		14.9		8.2		11	
WM4	10:37	0.37	18.1	18.1	7.78	7.8	81.9	82.4	29.9	30.2	8.4	8.4	25	25.5
			18.1		7.81		82.9		30.4		8.4		26	

Date	8-Jan-18															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	12:33	0.14	17.5	17.5	9.15	9.2	95.2	95.3	3.3	3.3	7.9	7.9	<2	<2
			17.5		9.17		95.4		3.4		7.9		<2	
WM4-CB	12:45	0.31	18.6	18.6	6.49	6.5	68.6	68.8	14.2	14.2	7.6	7.6	13	12.0
			18.6		6.52		68.9		14.2		7.6		11	
WM4	12:20	0.15	18.9	18.9	7.7	7.7	81.9	82.0	28.3	28.1	8	8.0	25	25.5
			18.9		7.71		82.0		27.8		8		26	

Date	10-Jan-18															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	12:27	0.19	13.1	13.1	12.33	12.3	118.4	117.7	5.0	4.9	8.2	8.2	<2	<2
			13.1		12.26		116.9		4.9		8.2		<2	
WM4-CB	12:41	0.27	17.1	17.1	7.81	7.8	79.9	79.7	10.5	10.5	8.2	8.2	7	7.0
			17.1		7.75		79.4		10.4		8.2		7	
WM4	12:20	0.16	16.6	16.6	9.32	9.3	93.6	93.3	19.1	18.8	8.3	8.3	17	16.0
			16.6		9.28		92.9		18.5		8.3		15	

Date	13-Jan-18															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	10:51	0.23	14.2	14.2	11.52	11.5	110.5	110.9	4.0	4.1	8.6	8.6	<2	<2
			14.2		11.57		111.3		4.2		8.6		<2	
WM4-CB	11:04	0.39	14.9	14.9	7.33	7.4	71.4	72.1	5.3	5.3	8.3	8.3	5	4.5
			14.9		7.4		72.7		5.3		8.3		4	
WM4	10:37	0.30	14.3	14.3	9.4	9.4	90.3	91.0	11.6	11.7	8.5	8.5	5	5.5
			14.3		9.47		91.7		11.7		8.5		6	

Date	16-Jan-18															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	13:35	0.15	21.3	21.3	9.24	9.3	102.9	103.2	4.0	3.8	8	8.0	3	3.0
			21.3		9.29		103.5		3.6		8		3	
WM4-CB	13:45	0.31	21.6	21.6	7.34	7.4	81.1	81.3	6.0	6.0	7.5	7.5	6	6.5
			21.6		7.37		81.4		6.0		7.5		7	
WM4	13:30	0.15	23.1	23.1	6.63	6.6	76.8	77.1	10.0	10.4	7.7	7.7	15	14.0
			23.1		6.65		77.4		10.7		7.7		13	

Date	18-Jan-18															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	11:15	0.14	20.5	20.5	9.27	9.3	102.7	102.8	1.7	1.7	8.2	8.2	<2	<2
			20.5		9.26		102.9		1.8		8.2		<2	
WM4-CB	11:25	0.31	21.8	21.8	6.43	6.4	71.8	72.1	5.4	5.3	7.7	7.7	5	4.5
			21.8		6.45		72.3		5.2		7.7		4	
WM4	11:10	0.15	21.3	21.3	7.47	7.5	83.2	83.3	9.0	9.2	8.3	8.3	11	10.0
			21.3		7.46		83.3		9.3		8.3		9	

Date	20-Jan-18															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	11:21	0.19	19.8	19.8	8.84	8.9	96.3	96.8	7.5	7.5	7.9	7.9	<2	<2
			19.8		8.91		97.2		7.5		7.9		<2	
WM4-CB	11:37	0.38	19.7	19.7	5.27	5.3	57.3	57.7	12.2	12.3	8	8.0	18	18.0
			19.7		5.3		58.1		12.4		8		18	
WM4	11:01	0.21	19.7	19.7	7.75	7.8	84.1	85.1	15.1	15.3	7.8	7.8	18	19.0
			19.7		7.79		86.1		15.4		7.8		20	

Date	22-Jan-18															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	12:10	0.15	25	25.0	7.45	7.5	89.9	90.0	4.7	4.3	7.7	7.8	<2	<2
			25		7.47		90.1		3.9		7.8		<2	
WM4-CB	12:20	0.31	23.7	23.7	5.63	5.7	66.6	66.8	9.6	9.0	7.4	7.4	7	7.5
			23.7		5.67		67.0		8.5		7.4		8	
WM4	12:00	0.15	25.5	25.5	5.77	5.8	70.4	70.6	15.5	14.2	7.6	7.6	20	19.5
			25.5		5.81		70.7		12.9		7.6		19	

Date	24-Jan-18															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	11:15	0.15	19.5	19.5	10.11	10.1	109.2	109.7	2.0	1.7	8	8.0	<2	<2
			19.5		10.12		110.2		1.3		8		<2	
WM4-CB	11:30	0.31	19.5	19.5	7.34	7.4	79.1	79.2	11.2	11.2	7.6	7.6	11	11.5
			19.5		7.36		79.3		11.1		7.6		12	
WM4	11:05	0.15	19.5	19.5	7.83	7.8	84.7	84.8	8.5	8.8	7.8	7.8	10	10.0
			19.5		7.84		84.8		9.2		7.8		10	

Date	27-Jan-18															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	11:20	0.26	18.4	18.4	10.48	10.5	110.9	110.5	5.6	5.7	6.7	6.7	<2	<2
			18.4		10.47		110.1		5.7		6.7		<2	
WM4-CB	11:38	0.38	19.3	19.3	6.47	6.5	69.7	70.2	9.3	9.4	6.6	6.6	9	8.0
			19.3		6.5		70.7		9.4		6.6		7	
WM4	11:07	0.27	18.5	18.5	7.67	7.7	81.2	82.1	11.1	11.2	7.1	7.1	5	6.0
			18.5		7.71		82.9		11.3		7.1		7	

Date	29-Jan-18															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	11:40	0.15	11.5	11.5	12.17	12.2	110.5	110.4	4.6	4.6	7.7	7.7	<2	<2
			11.5		12.14		110.2		4.6		7.7		<2	
WM4-CB	11:50	0.31	11.7	11.7	9.07	9.1	82.7	82.8	7.8	7.7	7.5	7.5	4	4.0
			11.7		9.1		82.9		7.5		7.5		4	
WM4	11:30	0.15	12.1	12.1	10.14	10.2	92.8	93.1	6.3	6.1	7.6	7.6	8	7.0
			12.1		10.22		93.3		6.0		7.6		6	

Date	31-Jan-18															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM4-CA	12:10	0.15	12.3	12.3	11.79	11.8	106.1	106.4	4.6	4.4	8.4	8.4	3	4.0
			12.3		11.81		106.6		4.3		8.4		5	
WM4-CB	12:25	0.31	12.8	12.8	8.35	8.4	76.8	76.9	27.0	25.9	8	8.0	25	25.5
			12.8		8.38		77.0		24.8		8		26	
WM4	12:00	0.15	12.7	12.7	10.76	10.8	98.3	98.5	28.0	27.8	8.3	8.3	27	26.0
			12.7		10.79		98.6		27.6		8.3		25	

Water Quality Monitoring Data for Contract 6

Date	**2-Jan-18**													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	10:40	0.28	18.8	18.8	9.35	9.4	100.6	100.7	8.7	8.9	8.10	8.1	<2	<2
			18.8		9.36		100.7		9.1		8.10		<2	
WM2A	10:30	1.00	22.3	22.3	7.15	7.1	79.8	79.7	12.5	12.1	7.90	7.9	8	7.5
			22.3		7.12		79.6		11.7		7.90		7	

Date	**4-Jan-18**													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	10:35	0.28	19.5	19.5	8.34	8.3	91.3	91.3	13.7	13.7	8.10	8.1	3	3.0
			19.5		8.33		91.3		13.7		8.10		3	
WM2A	10:25	1.00	20.3	20.3	6.76	6.8	75.4	75.2	11.3	11.4	7.90	7.9	6	5.5
			20.3		6.77		75.0		11.4		7.90		5	

Date	**6-Jan-18**													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	9:39	0.37	18	18.0	9.7	9.7	101.9	102.5	65.6	65.9	8.10	8.1	29	30.0
			18		9.74		103.1		66.1		8.10		31	
WM2A	9:24	1.04	18.4	18.4	7.49	7.5	79.4	80.2	17.7	17.8	8.20	8.2	10	11.0
			18.4		7.54		81.0		17.8		8.20		12	

Date	**8-Jan-18**													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	10:15	0.28	20.4	20.4	9.81	9.8	109.4	109.4	27.3	27.6	7.70	7.7	10	11.0
			20.4		9.8		109.3		27.8		7.70		12	
WM2A	10:24	1.00	20.4	20.4	8.55	8.6	94.0	94.1	71.2	**71.3**	7.80	7.8	34	**34.0**
			20.4		8.57		94.2		71.3		7.80		34	

Date	**9-Jan-18#**													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	9:40	0.28							47.7	45.1			23	23.0
									42.4				23	
WM2A	9:50	1.00							296.0	**290.5**			158	**158.0**
									285.0				158	

Date	**10-Jan-18**													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	10:41	0.26	13.6	13.6	10.48	10.5	99.7	99.4	43.7	43.5	8.40	8.4	20	19.5
			13.6		10.43		99.1		43.2		8.40		19	
WM2A	10:26	1.08	15.4	15.4	8.28	8.3	81.6	81.5	117.0	**115.0**	8.40	8.4	64	**62.0**
			15.4		8.26		81.4		113.0		8.40		60	

Date	**11-Jan-18#**													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	10:45	0.28							35.1	35.0			18	18.0
									34.9				18	
WM2A	10:10	1.00							67.7	**67.2**			52	**52.0**
									66.6				52	

Date	**12-Jan-18#**													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	11:00	0.28							24.8	24.8			16	16.0
									24.7				16	
WM2A	11:20	1.00							39.2	**39.1**			20	**20.0**
									38.9				20	

Date	**13-Jan-18**													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	9:37	0.31	12.8	12.8	11.81	11.8	109.4	105.2	26.6	26.7	8.00	8.0	8	7.0
			12.8		11.85		101.0		26.8		8.00		6	
WM2A	9:20	0.20	12.3	12.3	12.73	12.7	116.8	116.9	58.1	**58.3**	8.00	8.0	33	**34.5**
			12.3		12.75		117.0		58.4		8.00		36	

Date	**15-Jan-18#**													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	10:00	0.28							13.5	13.4			9	9.0
									13.3				9	
WM2A	9:50	0.13							14.5	14.0			8	8.0
									13.4				8	

Date	**16-Jan-18**															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	11:00	0.28	20.2	20.2	7.83	7.8	84.1	84.1	18.7	18.2	8.00	8.0	7	7.0
			20.2		7.81		84.0		17.6		8.00		7	
WM2A	10:20	0.12	15.6	15.6	9.24	9.2	97.4	97.2	10.3	10.0	8.10	8.1	4	4.5
			15.6		9.18		96.9		9.6		8.10		5	

Date	**18-Jan-18**															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	10:20	0.28	20.5	20.5	8.28	8.3	90.0	90.2	17.5	17.4	7.90	7.9	7	6.0
			20.5		8.31		90.3		17.3		7.90		5	
WM2A	10:00	0.15	19.1	19.1	9.32	9.3	99.5	99.4	22.0	22.8	8.00	8.0	7	7.0
			19.1		9.29		99.3		23.5		8.00		7	

Date	**20-Jan-18**															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	9:38	0.31	18.7	18.7	9.4	9.4	100.5	101.2	17.4	17.5	8.90	8.9	4	5.0
			18.7		9.45		101.9		17.5		8.90		6	
WM2A	9:57	0.17	17.8	17.8	9.79	9.8	102.6	102.9	16.8	17.0	8.40	8.4	11	10.5
			17.8		9.81		103.1		17.1		8.40		10	

Date	**22-Jan-18**															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	10:33	0.28	24.9	24.9	6.22	6.2	74.7	74.9	19.2	19.6	7.90	7.9	5	5.5
			24.9		6.25		75.0		19.9		7.90		6	
WM2A	11:00	0.13	21.4	21.4	7.76	7.7	87.8	87.6	14.4	14.3	7.80	7.8	8	7.0
			21.4		7.69		87.3		14.1		7.80		6	

Date	**24-Jan-18**															
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	10:15	0.28	18.9	18.9	8.73	8.8	96.3	96.8	27.3	26.3	7.70	7.7	12	11.0
			18.9		8.9		97.3		25.3		7.70		10	
WM2A	9:55	0.15	18.8	18.8	9.88	9.9	105.8	105.7	7.7	7.7	7.80	7.8	4	3.5
			18.8		9.83		105.6		7.7		7.80		3	

Date	**27-Jan-18**													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	10:07	0.27	17.4	17.4	9.62	9.7	99.6	100.2	26.9	27.0	8.10	8.1	9	8.0
			17.4		9.71		100.7		27.1		8.10		7	
WM2A	9:50	0.15	17.1	17.1	10.69	10.7	110.1	110.8	14.7	14.8	8.10	8.1	6	5.5
			17.1		10.73		111.4		14.9		8.10		5	

Date	**29-Jan-18**													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	10:10	0.28	11.4	11.4	13.35	13.4	120.8	120.9	19.9	19.3	7.90	7.9	10	9.5
			11.4		13.37		120.9		18.6		7.90		9	
WM2A	10:00	0.15	12.3	12.3	14.08	14.1	129.6	129.6	10.2	10.0	7.90	7.9	4	4.0
			12.3		14.1		129.6		9.9		7.90		4	

Date	**31-Jan-18**													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM2A-C	10:37	0.28	12	12.0	13.41	13.6	120.1	120.9	775.0	777.0	7.80	7.8	410	408.0
			12		13.69		121.7		779.0		7.80		406	
WM2A	10:15	0.18	11.7	11.7	12.76	12.8	115.6	115.7	501.0	516.5	7.80	7.8	276	268.5
			11.7		12.78		115.7		532.0		7.80		261	

Remarks: *# Additional water quality monitoring for the parameters with Action/Limit Level exceedance triggered only.*

	Action Level
	Limit Level

Water Quality Monitoring Data for Contract 2 and 6

Date	2-Jan-18													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	11:00	0.15	21.9	21.9	9.81	9.8	110.8	110.8	6.2	5.3	9.3	9.3	14	13.5
			21.9		9.8		110.7		4.5		9.3		13	
WM3	11:10	0.15	20.7	20.7	9.04	9.0	102.1	102.3	11.4	11.1	8.9	8.9	6	5.0
			20.7		9.05		102.4		10.8		8.9		4	

Date	4-Jan-18													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	10:50	0.15	21.8	21.8	9.7	9.7	109.8	109.7	3.6	3.3	11	11.0	9	9.5
			21.8		9.67		109.5		3.0		11		10	
WM3	11:05	0.15	21	21.0	9.11	9.1	101.6	101.8	7.9	7.6	9.6	9.6	5	5.0
			21		9.15		101.9		7.4		9.6		5	

Date	6-Jan-18													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	9:49	0.14	21.3	21.3	11	11.2	120.0	120.6	10.8	10.8	10.3	10.3	15	15.5
			21.3		11.3		121.1		10.8		10.3		16	
WM3	10:01	0.17	19	19.0	9.62	9.6	102.8	103.4	9.4	9.4	9.2	9.2	7	7.0
			19		9.67		103.9		9.4		9.2		7	

Date	8-Jan-18													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	11:35	0.15	21.4	21.4	10.14	10.1	111.5	111.6	3.5	3.3	9.8	9.8	4	3.0
			21.4		10.15		111.6		3.1		9.8		2	
WM3	11:25	0.15	19.1	19.1	9.51	9.5	102.2	102.4	19.9	**20.0**	7.8	7.8	15	**14.5**
			19.1		9.56		102.6		20.1		7.8		14	

Date	9-Jan-18#													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	9:30	0.15							6.8	7.3			7	7.0
									7.8				7	
WM3	9:20	0.15							12.9	12.3			9	9.0
									11.6				9	

Date	10-Jan-18													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-C	9:31	0.12	17	17.0	15.68	15.7	158.5	158.6	17.4	18.3	11.1	11.1	24	25.0
			17		15.69		158.7		19.1		11.1		26	
WM3	9:49	0.15	16.6	16.6	11.39	11.3	113.0	112.3	17.9	18.2	8.5	8.5	8	8.0
			16.6		11.28		111.6		18.5		8.5		8	

Date	13-Jan-18													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-C	9:49	0.16	14.1	14.2	13.85	13.9	133.8	134.0	21.2	21.6	10.8	10.8	12	13.5
			14.2		13.87		134.1		22.0		10.8		15	
WM3	10:00	0.14	13.6	13.6	11.96	12.0	113.2	113.8	11.1	11.2	8.8	8.8	9	8.5
			13.6		11.99		114.3		11.3		8.8		8	

Date	16-Jan-18													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-C	11:30	0.15	22.23	22.2	9.39	9.4	106.9	106.9	10.2	10.0	9.6	9.6	37	35.5
			22.2		9.38		106.8		9.8		9.6		34	
WM3	11:45	0.15	24.1	24.1	6.98	7.0	81.5	81.7	13.2	13.3	8.7	8.7	13	12.0
			24.1		7.1		81.8		13.3		8.7		11	

Date	18-Jun-18													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-C	10:35	0.15	22	22.0	9.86	9.8	111.3	111.5	4.6	5.0	9.3	9.3	8	9.0
			22		9.8		111.7		5.4		9.3		10	
WM3	10:45	0.15	21.1	21.1	8.87	8.9	96.4	96.5	8.6	8.7	10.9	10.9	8	8.0
			21.1		8.86		96.5		8.8		10.9		8	

Date	20-Jan-18													
Location	Time	Depth (m)	Temp (oC)		DO (mg/L)		DO (%)		Turbidity (NTU)		pH		SS(mg/L)	
WM3-C	9:27	0.18	19.7	19.7	13.31	13.3	144.5	144.8	3.1	3.1	10.8	10.8	3	2.5
			19.7		13.37		145.1		3.1		10.8		2	
WM3	9:14	0.17	21	21.0	10.99	11.0	122.0	123.0	4.2	4.3	9.9	9.9	3	3.0
			21		11.07		123.9		4.3		9.9		3	

Date	22-Jan-18															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	10:10	0.15	24.6	24.6	9.21	9.2	110.7	110.7	7.0	7.0	8.6	8.6	13	12.0
			24.6		9.27		110.7		7.0		8.6		11	
WM3	10:00	0.15	23.8	23.8	8.97	9.0	106.2	106.4	13.4	13.1	8.4	8.4	12	12.0
			23.8		9		106.6		12.7		8.4		12	

Date	24-Jan-18															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	10:32	0.15	19.8	19.8	10.13	10.2	112.4	112.6	4.2	4.2	10	10.0	4	4.0
			19.8		10.17		112.7		4.2		10		4	
WM3	10:45	0.15	20.1	20.1	9.42	9.5	102.7	103.0	10.6	10.0	9.1	9.1	7	6.5
			20.1		9.48		103.2		9.4		9.1		6	

Date	27-Jan-18															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	10:23	0.15	17.2	17.2	13.51	13.6	139.1	140.9	9.7	9.7	6	6.0	8	8.0
			17.2		13.6		142.7		9.8		6		8	
WM3	10:37	0.17	16.4	16.4	10.43	10.5	105.9	106.5	148.0	**152.5**	6.1	6.1	693	**669.5**
			16.4		10.49		107.1		157.0		6.1		646	

Date	29-Jan-18															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	10:30	0.15	12.9	12.9	17.06	17.1	159.4	159.4	8.7	8.3	8.6	8.6	13	13.5
			12.9		17.04		159.4		7.9		8.6		14	
WM3	10:45	0.15	13	13.0	13	13.0	121.7	121.9	4.9	4.6	8	8.0	<2	<2
			13		13.05		122.0		4.3		8		<2	

Date	30-Jan-18#															
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	10:15	0.15							5.9	5.9			16	16.0
									5.9				16	
WM3	10:00	0.15							3.3	3.4			3	3.0
									3.5				3	

Date	31-Jan-18													
Location	**Time**	**Depth (m)**	**Temp (oC)**		**DO (mg/L)**		**DO (%)**		**Turbidity (NTU)**		**pH**		**SS(mg/L)**	
WM3-C	11:20	0.15	17	17.0	12.54	12.6	122.8	123.3	12.3	12.4	11.6	11.6	8	9.0
			17		12.64		123.7		12.5		11.6		10	
WM3	11:35	0.15	13.7	13.7	11.42	11.5	106.9	107.2	13.0	13.1	9.8	9.8	13	12.0
			13.7		11.52		107.4		13.2		9.8		11	

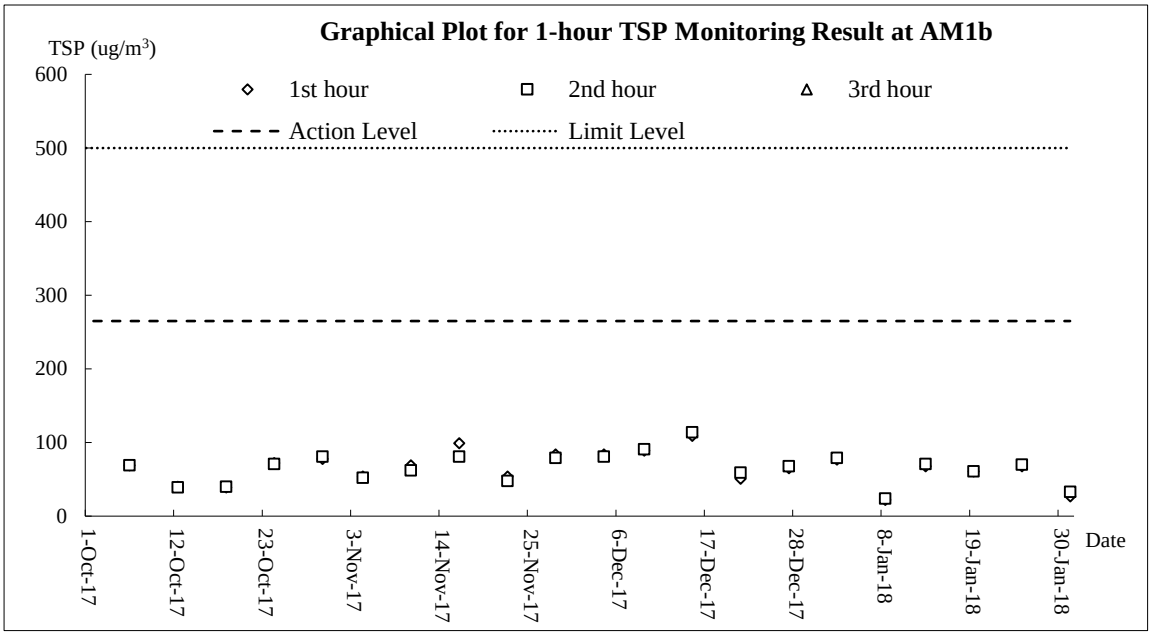
Remarks: *# Additional water quality monitoring for the parameters with Action/Limit Level exceedance triggered only.*

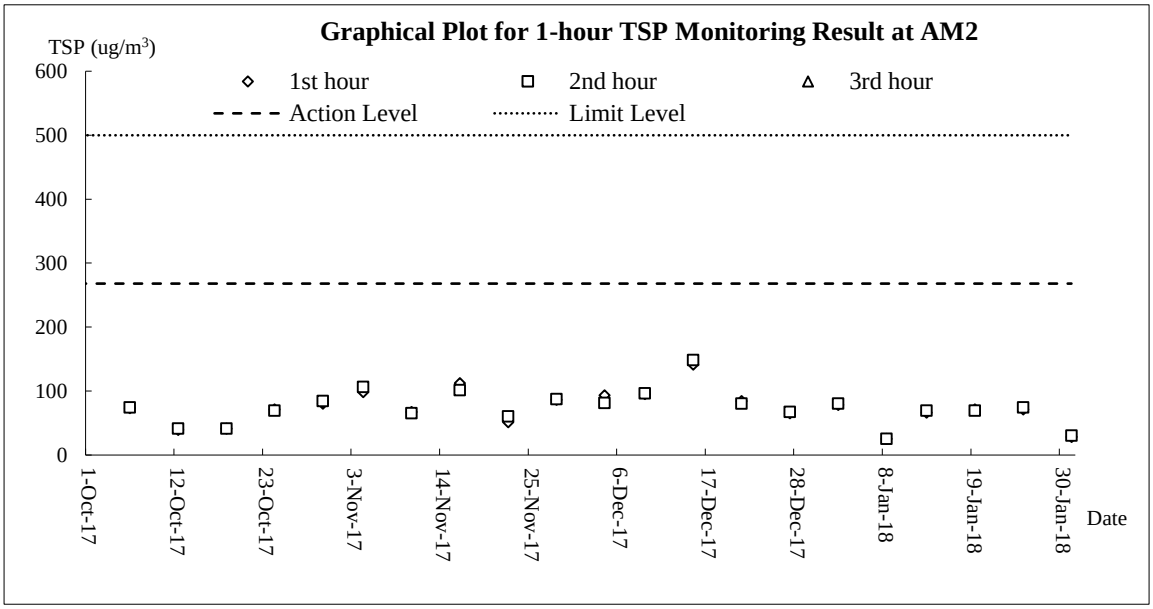
	Action Level
	Limit Level

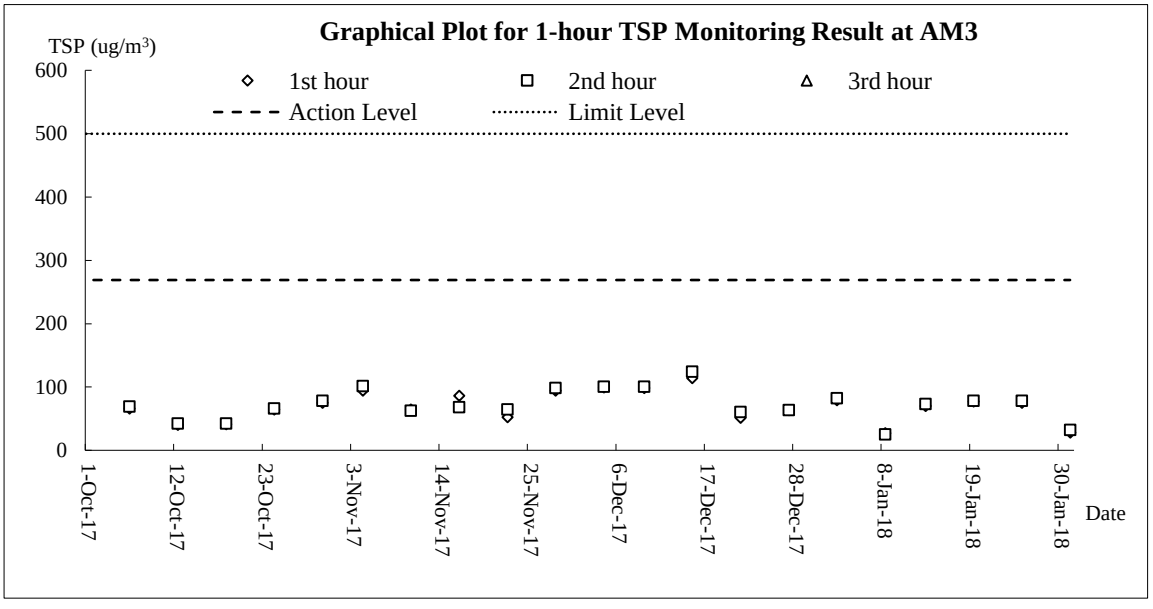
Appendix J

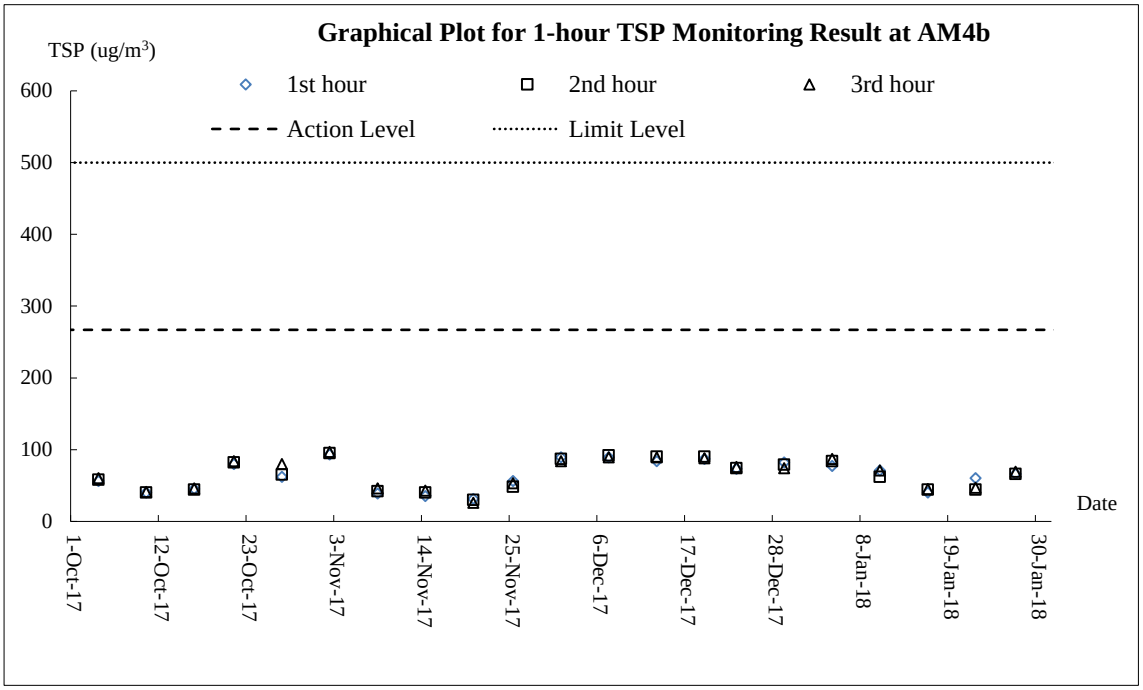
Graphical Plots for Monitoring Result

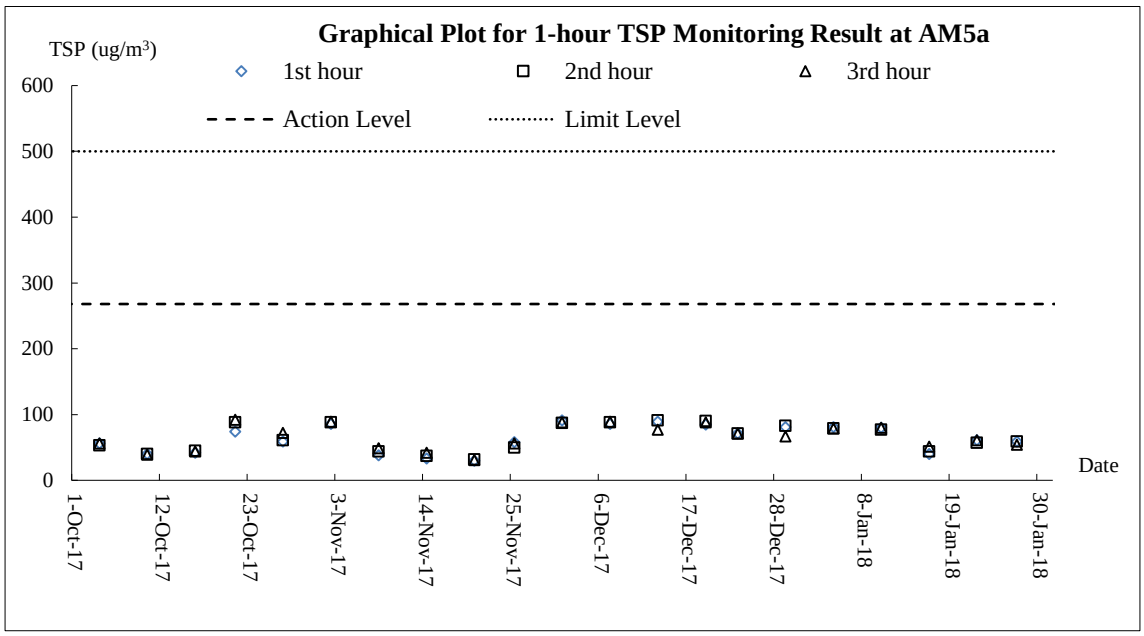
Air Quality – 1-hour TSP

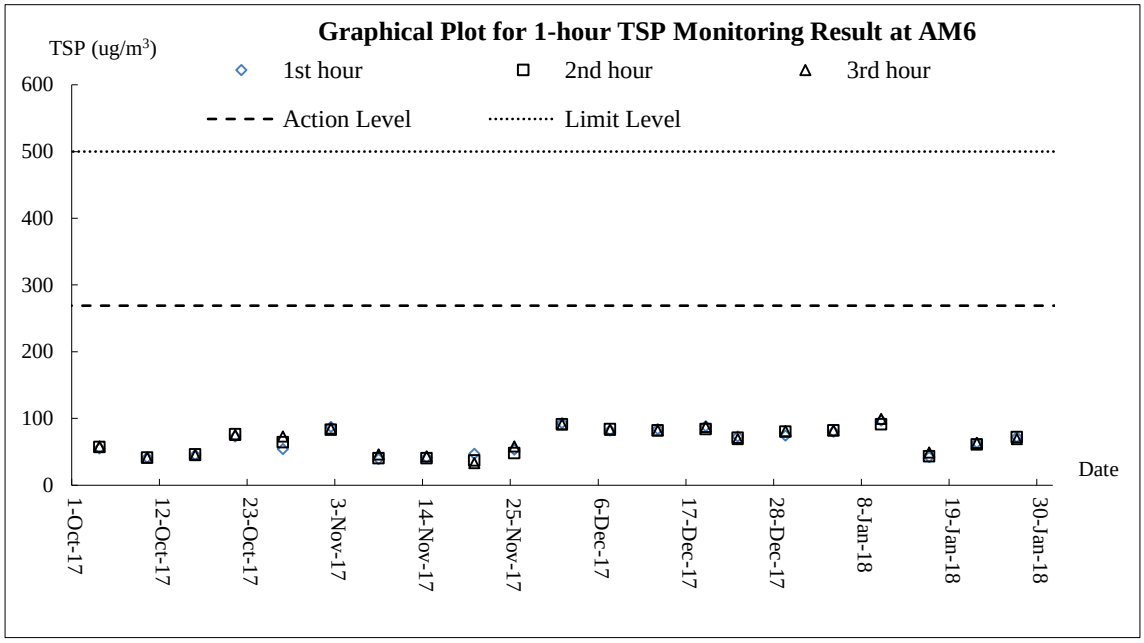


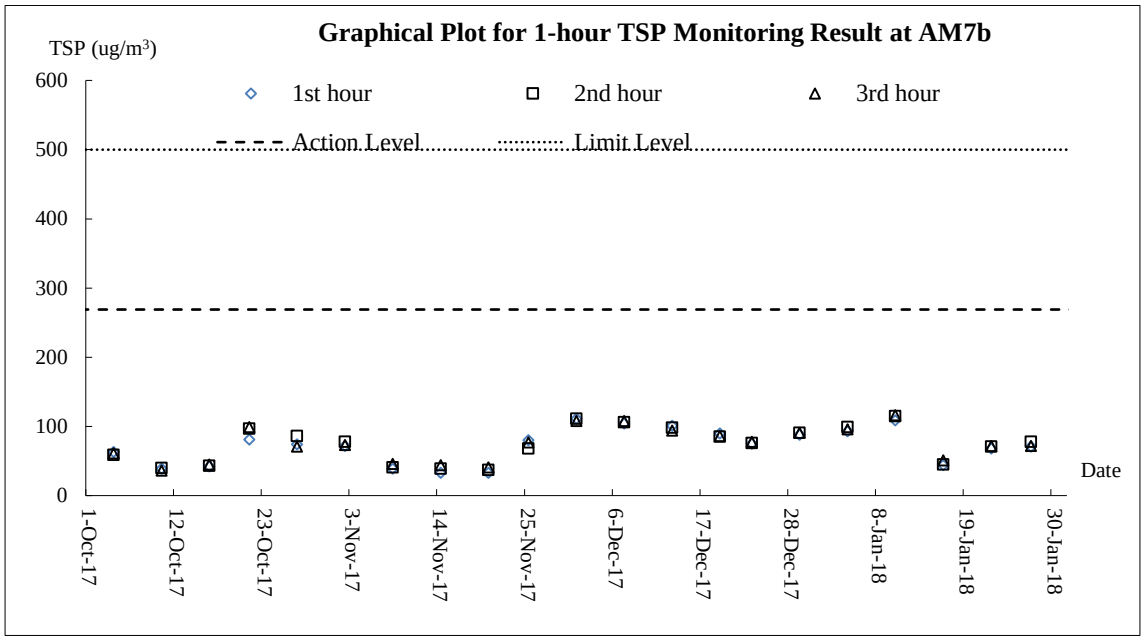


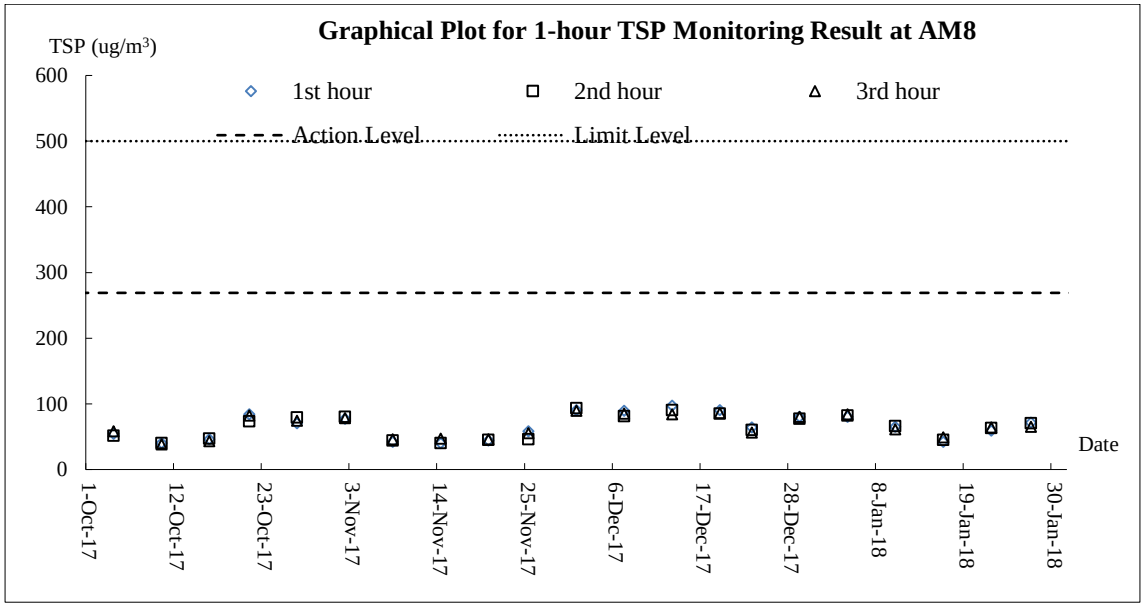


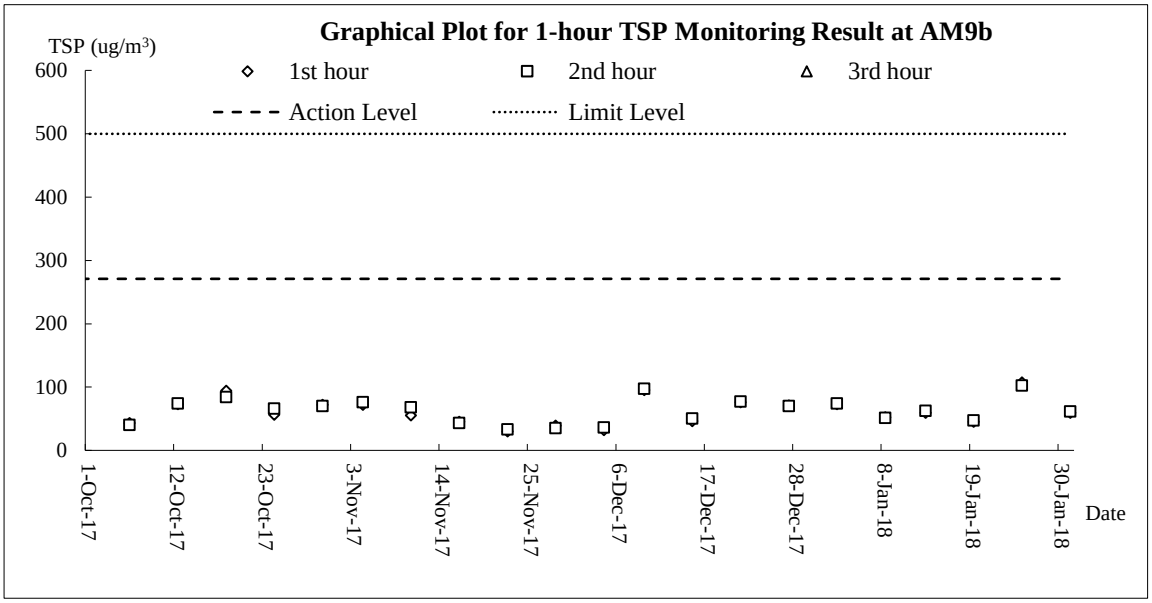

Graphical Plot for 1-hour TSP Monitoring Result at AM4b
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
Date
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18


Graphical Plot for 1-hour TSP Monitoring Result at AM5a
TSP (ug/m3)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
Date
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18

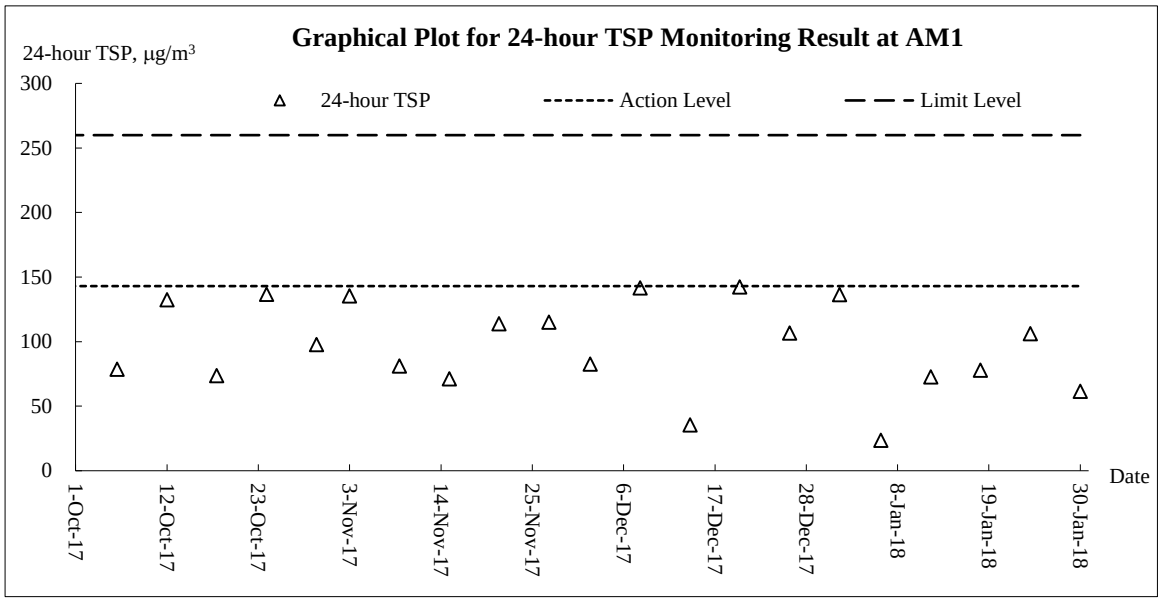

Graphical Plot for 1-hour TSP Monitoring Result at AM6
TSP (ug/m³)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
Date
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18

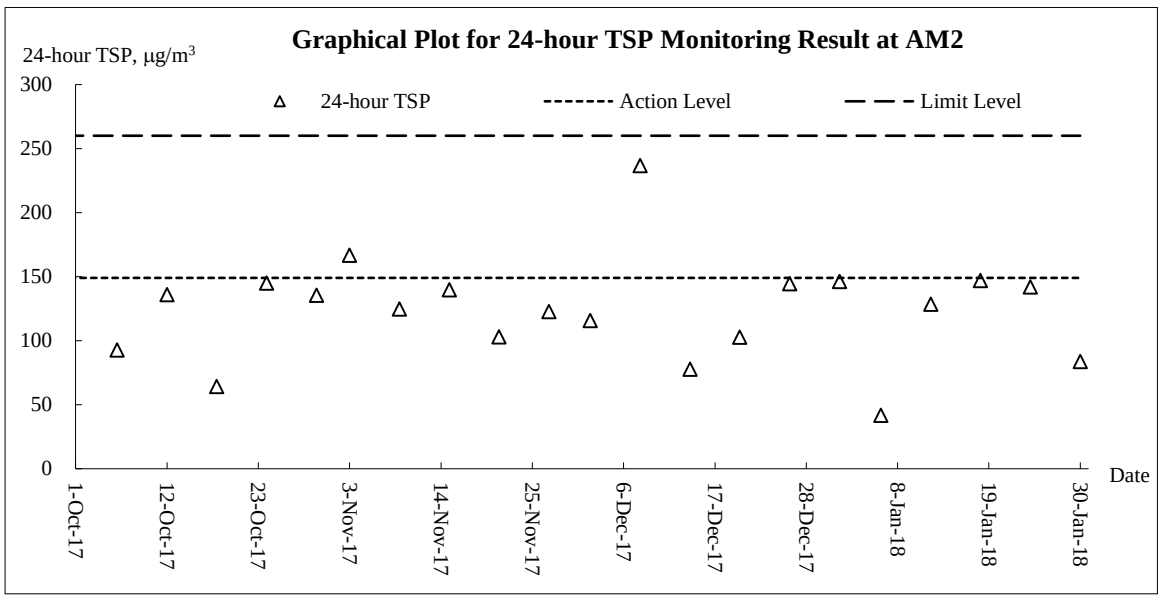

Graphical Plot for 1-hour TSP Monitoring Result at AM7b
TSP (ug/m³)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
Date
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18

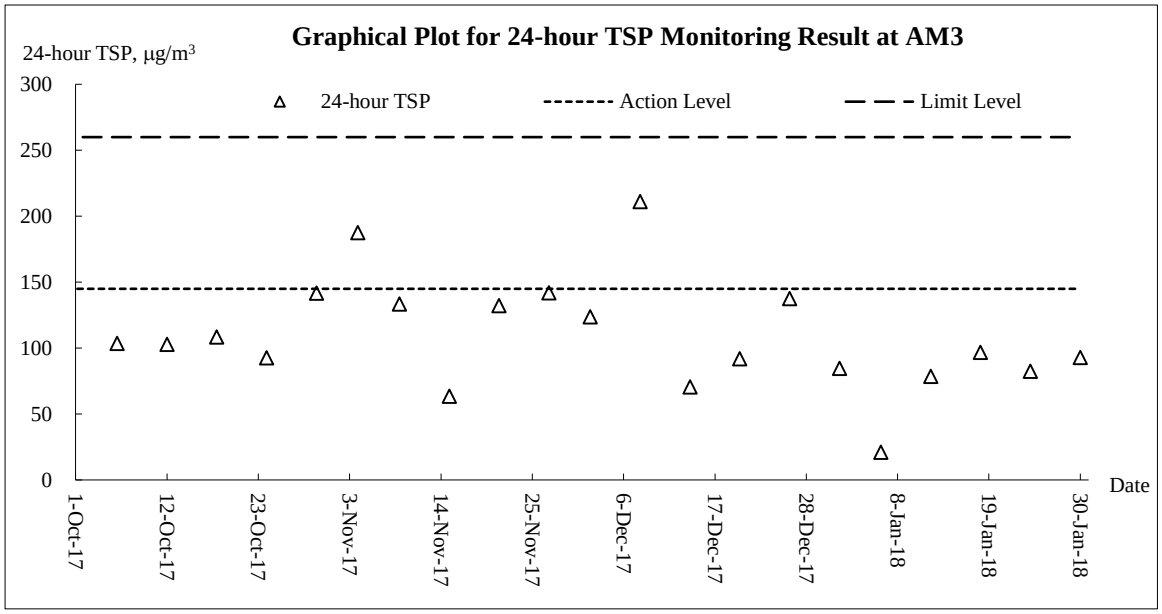

Graphical Plot for 1-hour TSP Monitoring Result at AM8
TSP (ug/m³)
1st hour
2nd hour
3rd hour
Action Level
Limit Level
600
500
400
300
200
100
0
Date
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18

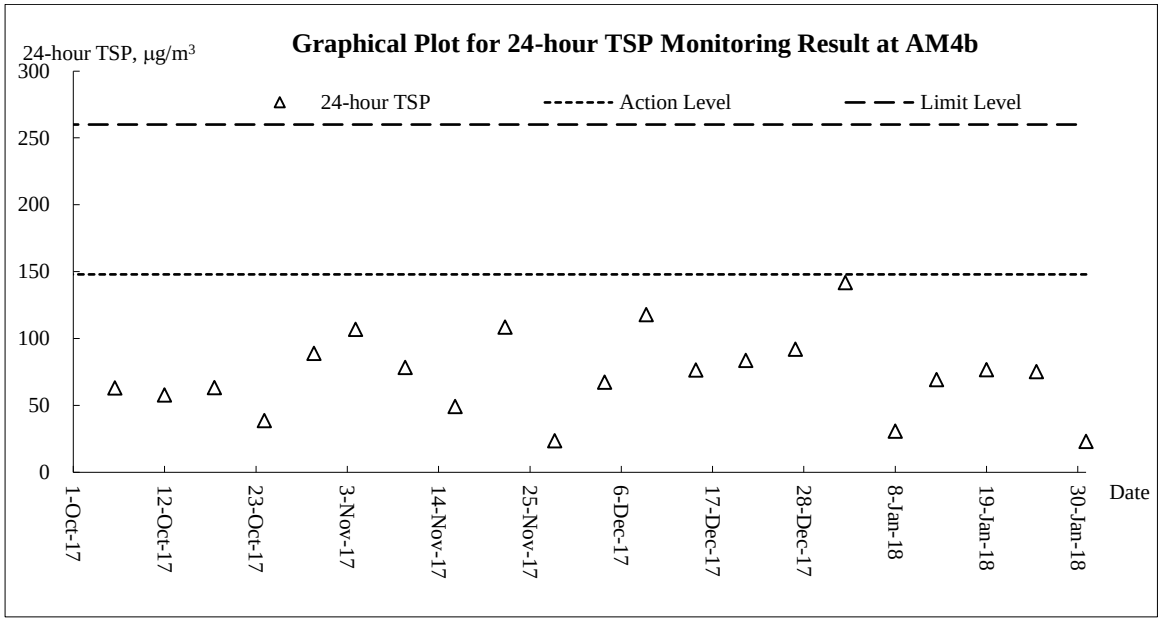


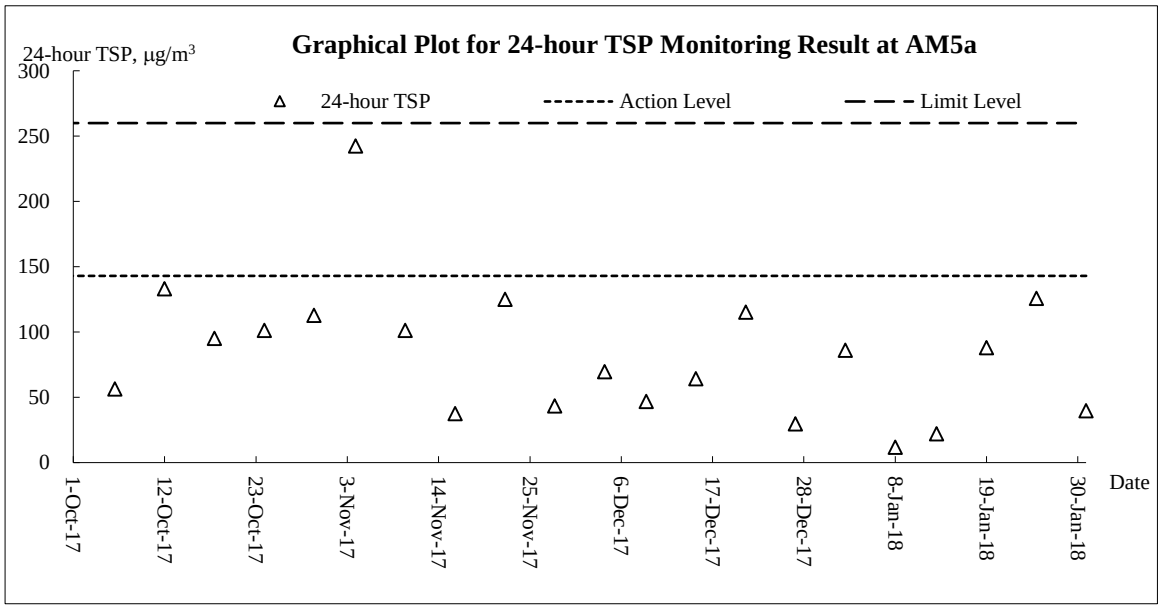
Air Quality – 24-hour TSP

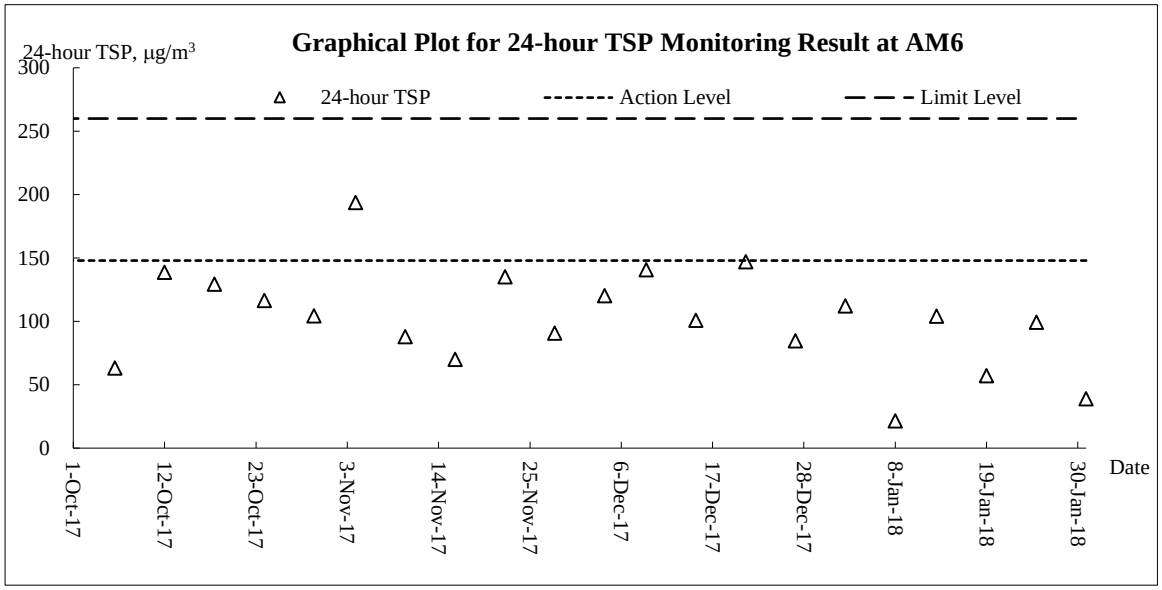


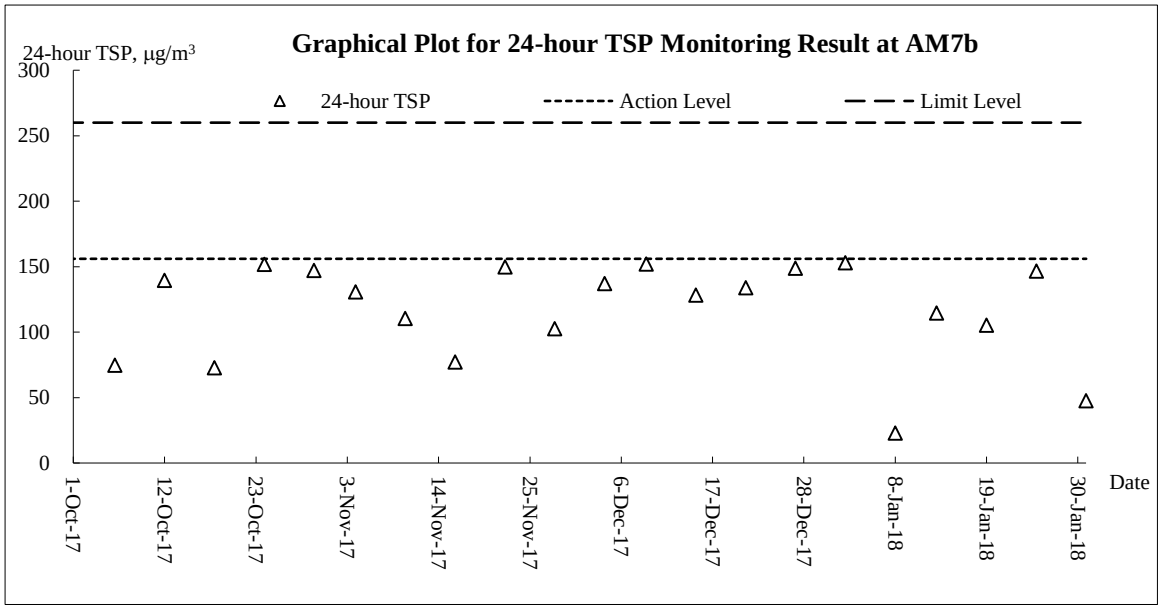


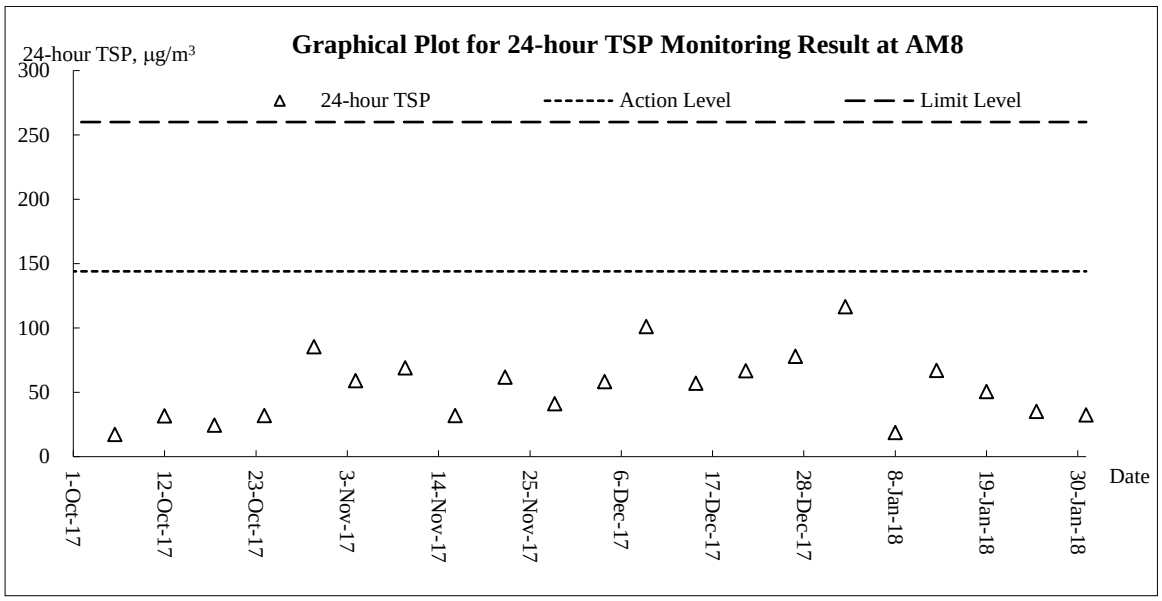

Graphical Plot for 24-hour TSP Monitoring Result at AM3
24-hour TSP, μg/m³
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18
Date

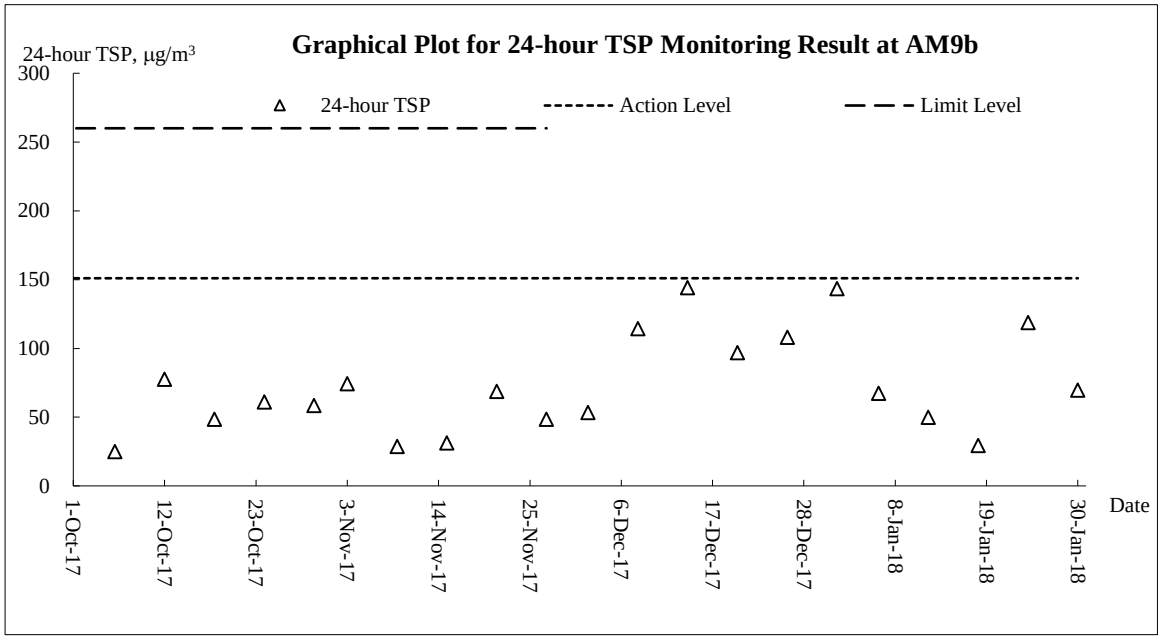

Graphical Plot for 24-hour TSP Monitoring Result at AM4b
24-hour TSP, μg/m³
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18
Date


Graphical Plot for 24-hour TSP Monitoring Result at AM5a
24-hour TSP, μg/m³
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18
Date

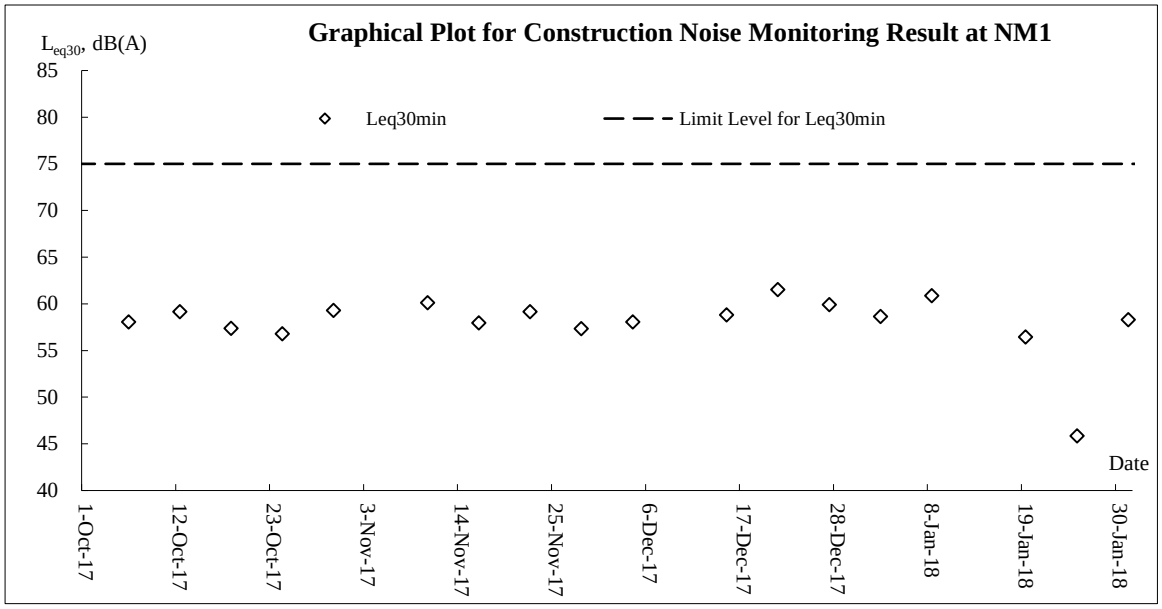

Graphical Plot for 24-hour TSP Monitoring Result at AM6
24-hour TSP, μg/m³
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18
Date

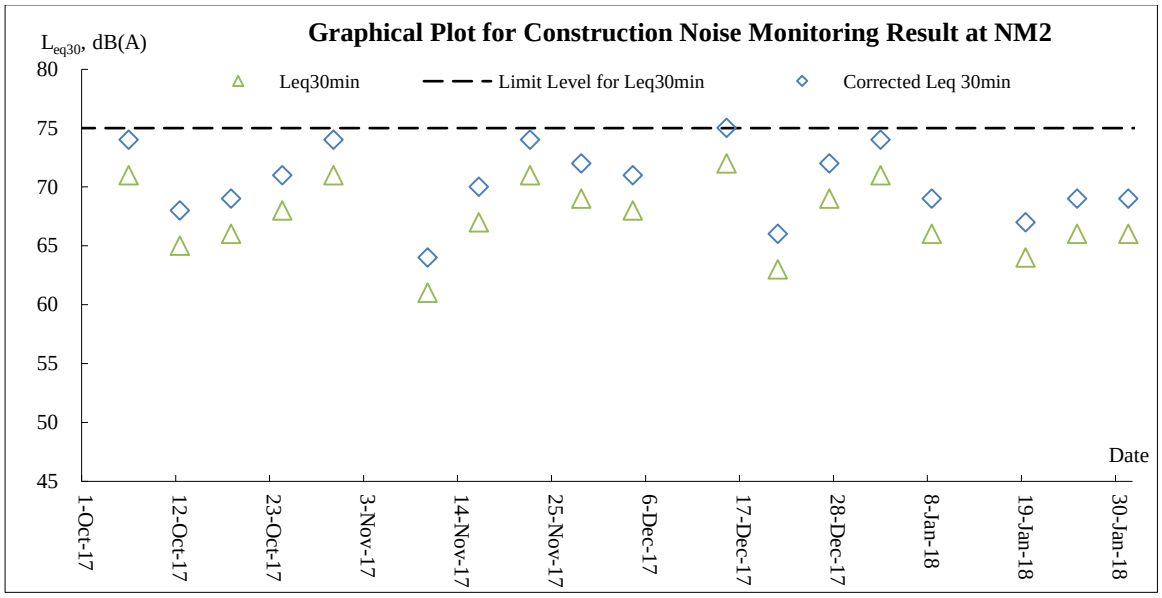

Graphical Plot for 24-hour TSP Monitoring Result at AM7b
24-hour TSP, μg/m³
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18
Date

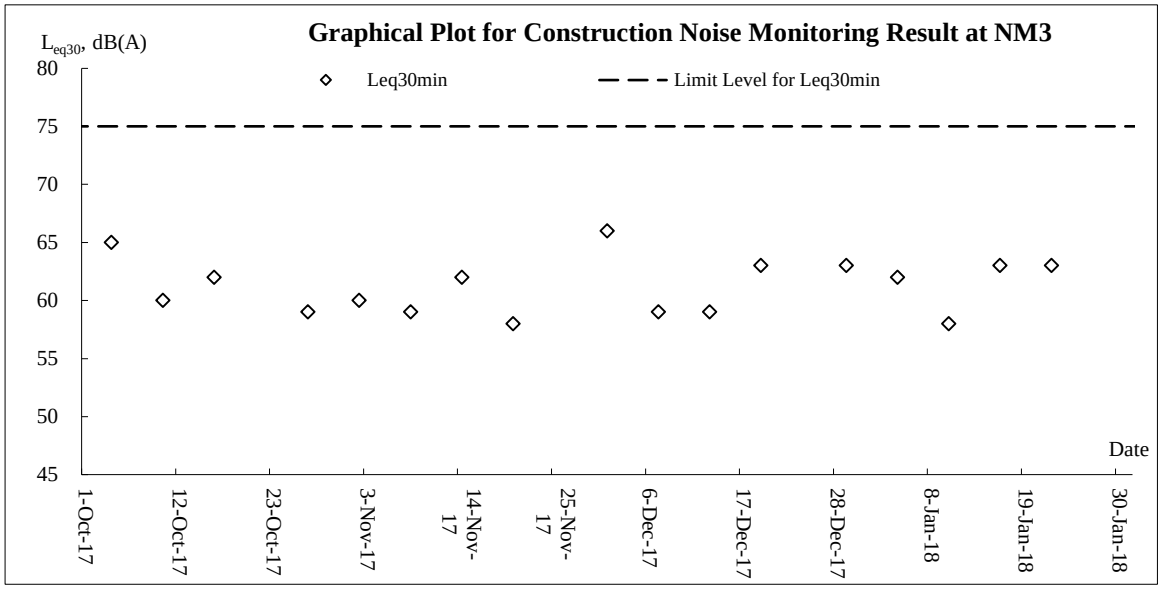

Graphical Plot for 24-hour TSP Monitoring Result at AM8
24-hour TSP, μg/m³
24-hour TSP
Action Level
Limit Level
300
250
200
150
100
50
0
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18
Date

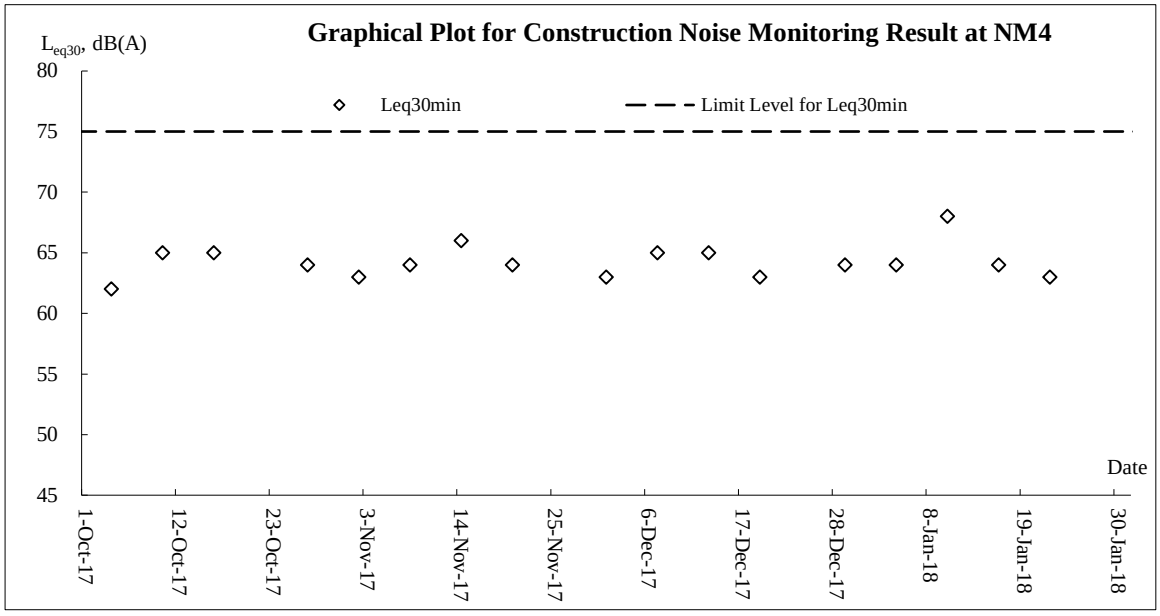

Graphical Plot for 24-hour TSP Monitoring Result at AM9b
24-hour TSP, μg/m3
300
250
200
150
100
50
0
24-hour TSP
Action Level
Limit Level
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18
Date

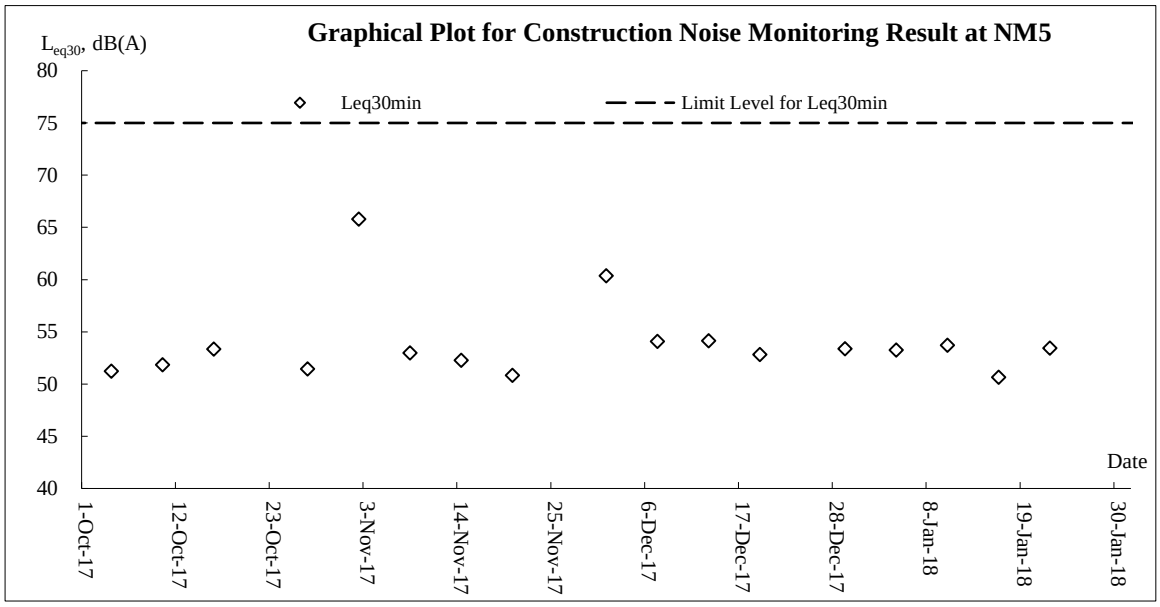
Noise

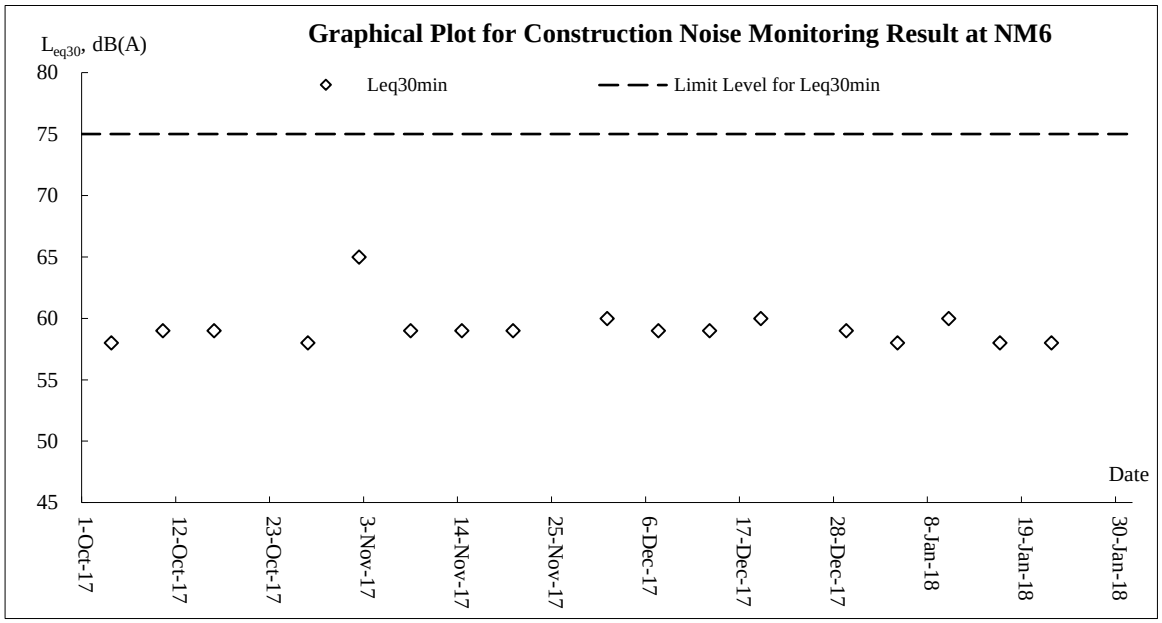

Graphical Plot for Construction Noise Monitoring Result at NM1
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
85
80
75
70
65
60
55
50
45
40
Date
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18

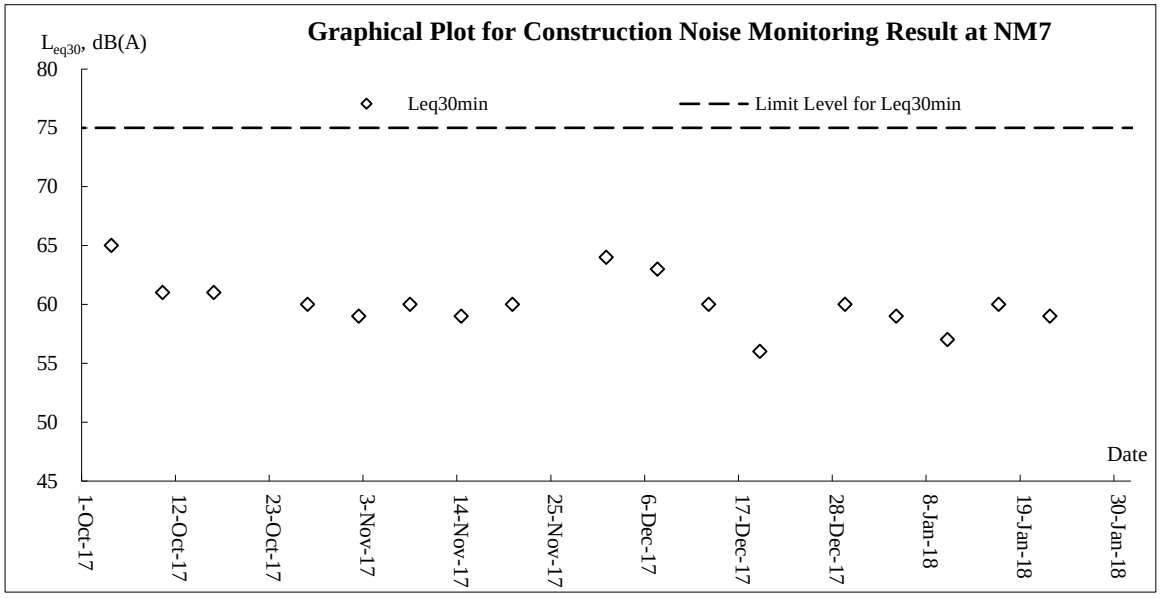

Graphical Plot for Construction Noise Monitoring Result at NM2
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
Corrected Leq 30min
80
75
70
65
60
55
50
45
Date
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18

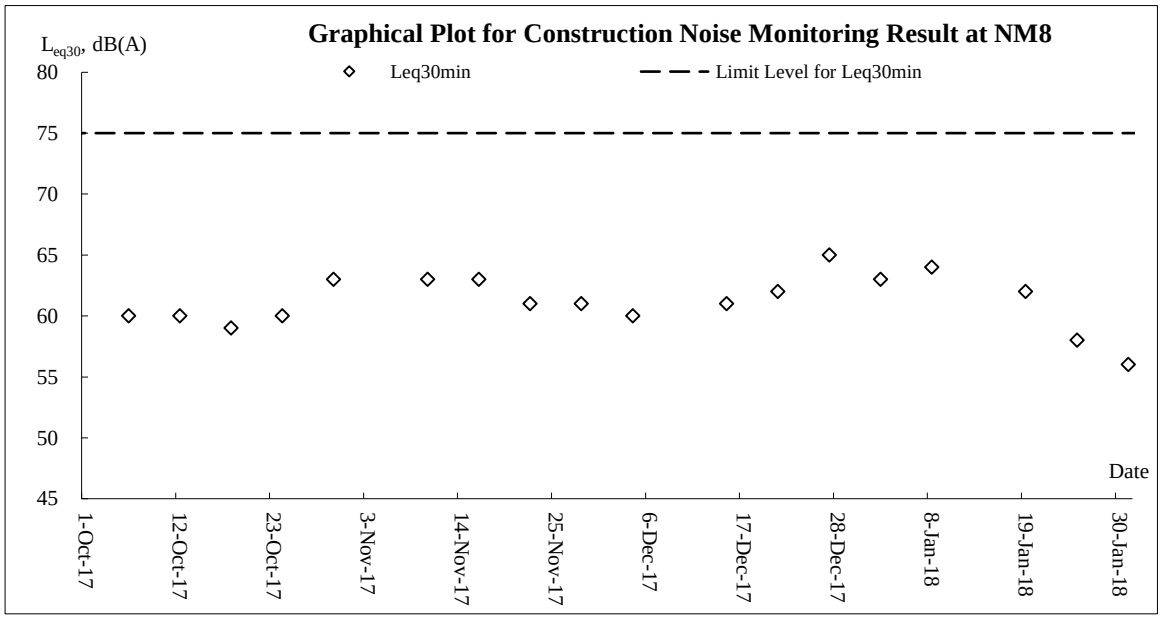

Graphical Plot for Construction Noise Monitoring Result at NM3
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
80
75
70
65
60
55
50
45
Date
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18

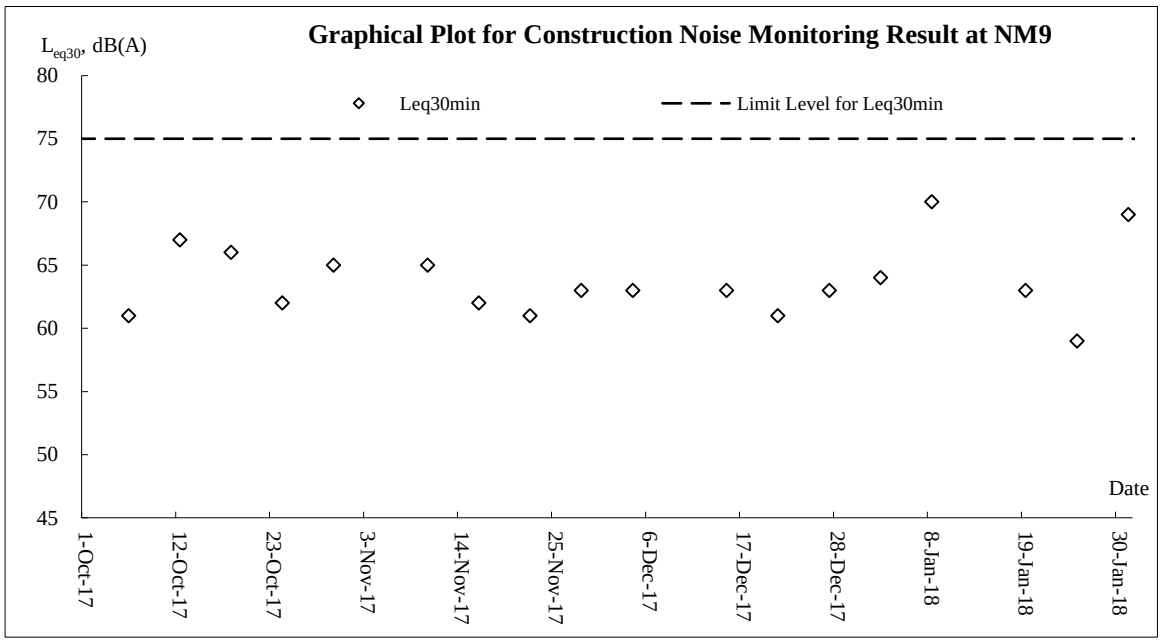

Graphical Plot for Construction Noise Monitoring Result at NM4
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
Date
80
75
70
65
60
55
50
45
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18

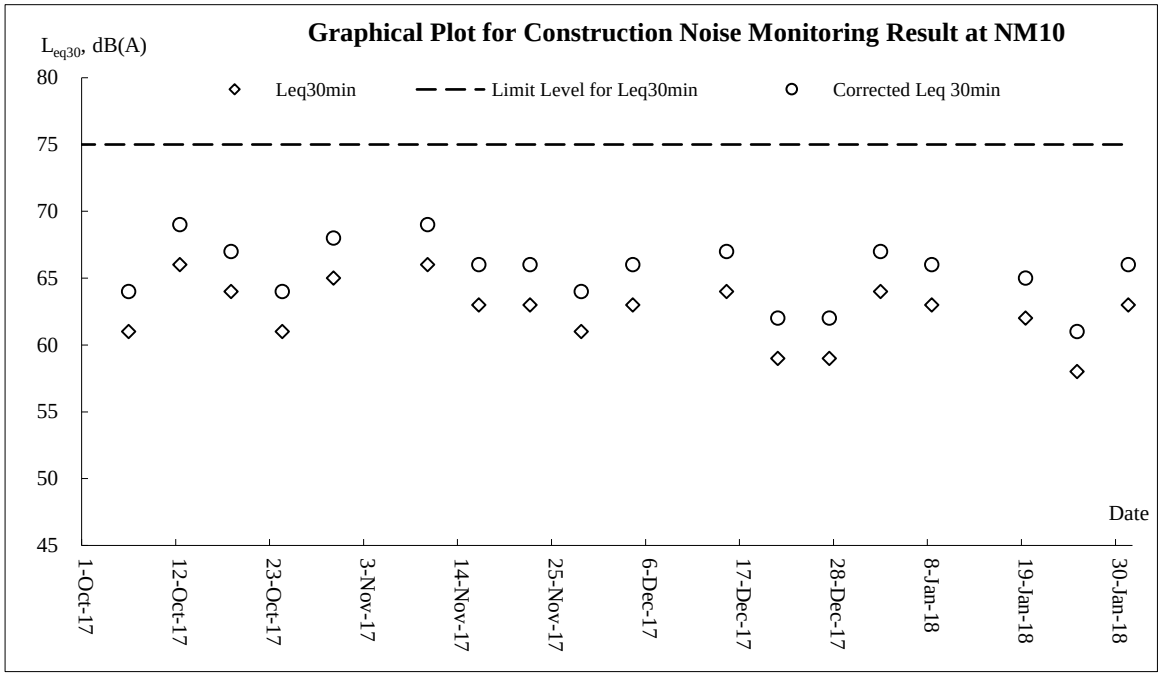

Graphical Plot for Construction Noise Monitoring Result at NM5
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
Date
80
75
70
65
60
55
50
45
40
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18


Graphical Plot for Construction Noise Monitoring Result at NM6
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
Date
80
75
70
65
60
55
50
45
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18

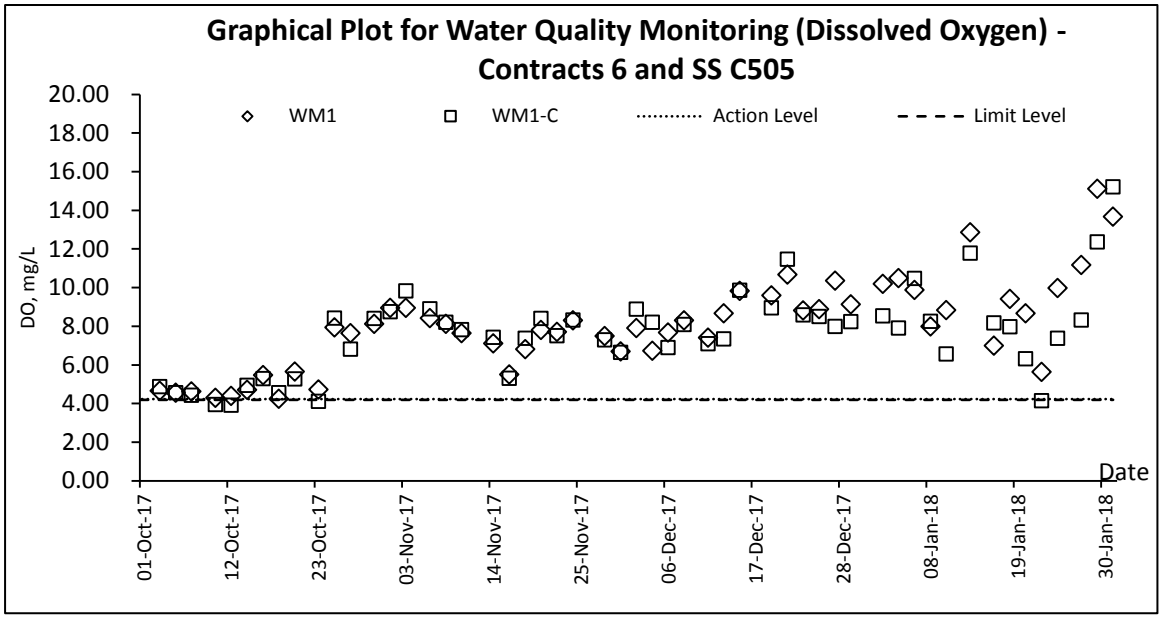

Graphical Plot for Construction Noise Monitoring Result at NM7
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
80
75
70
65
60
55
50
45
Date
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18

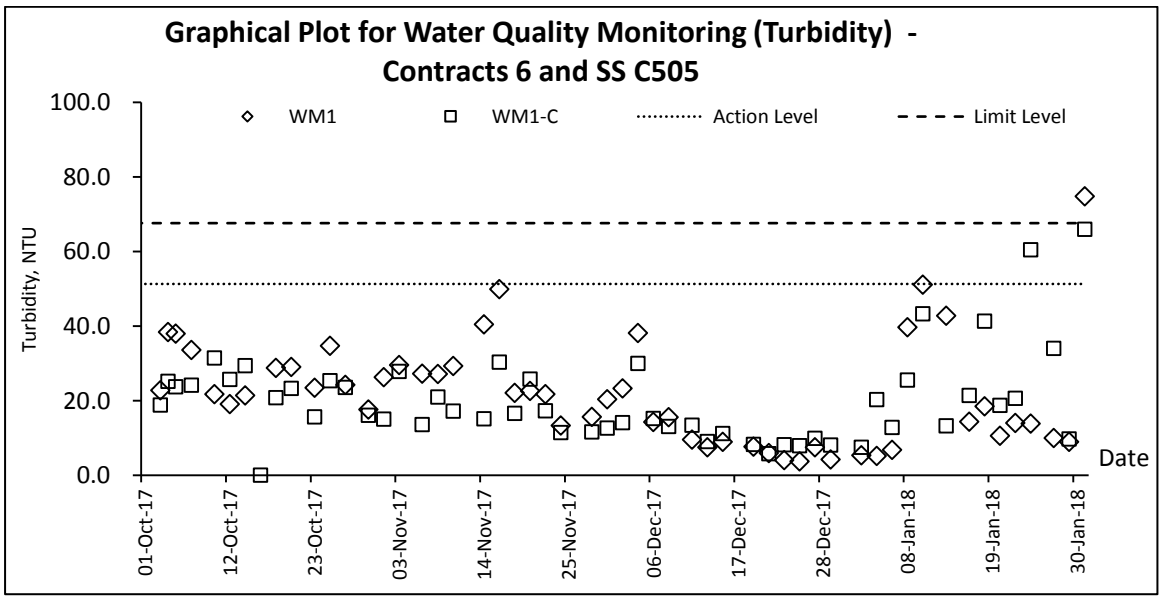

Graphical Plot for Construction Noise Monitoring Result at NM8
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
80
75
70
65
60
55
50
45
Date
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18

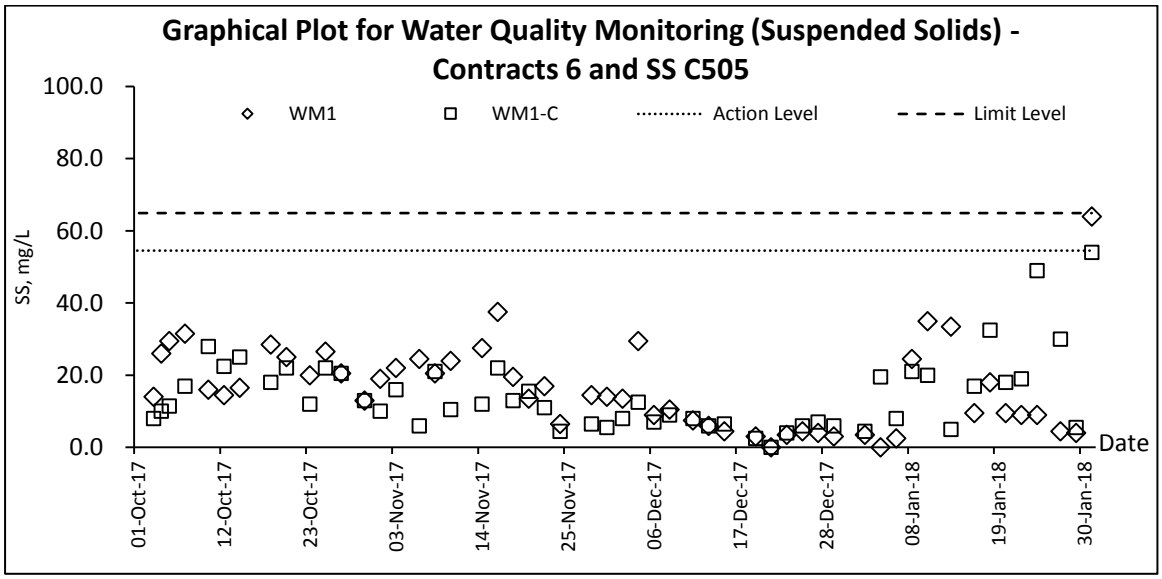

Graphical Plot for Construction Noise Monitoring Result at NM9
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
80
75
70
65
60
55
50
45
Date
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18

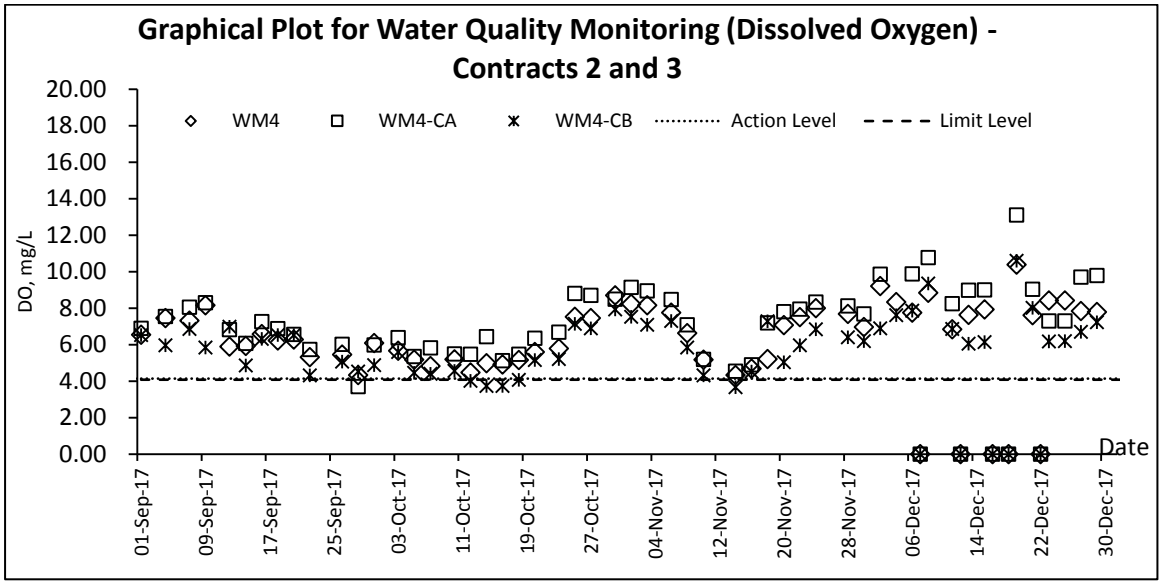

Graphical Plot for Construction Noise Monitoring Result at NM10
L_{eq30}, dB(A)
Leq30min
Limit Level for Leq30min
Corrected Leq 30min
80
75
70
65
60
55
50
45
Date
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18

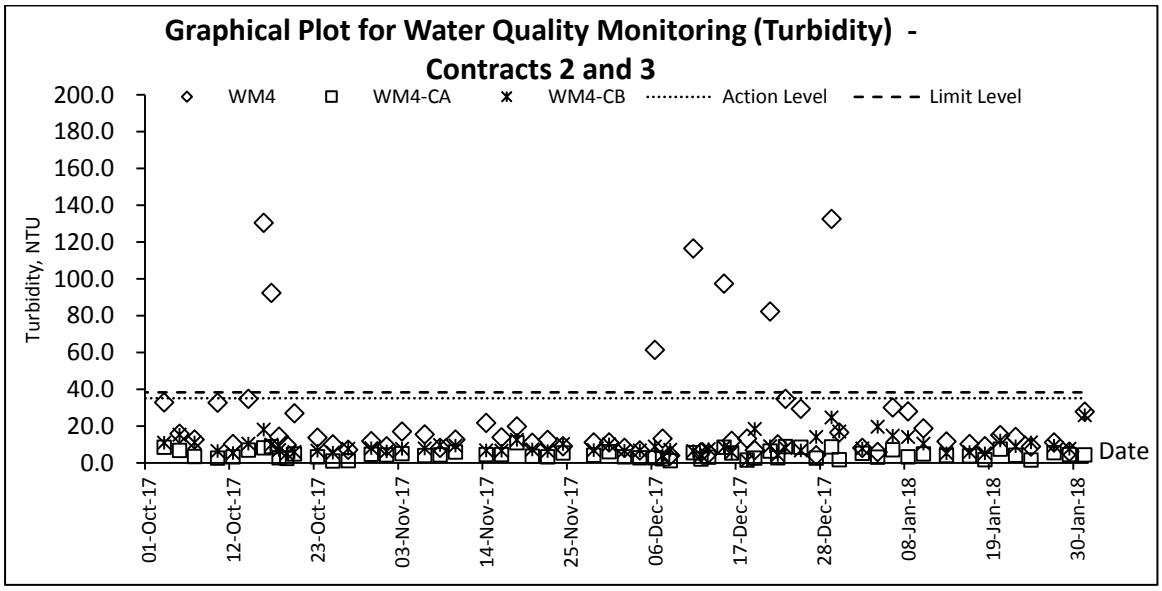
Water Quality

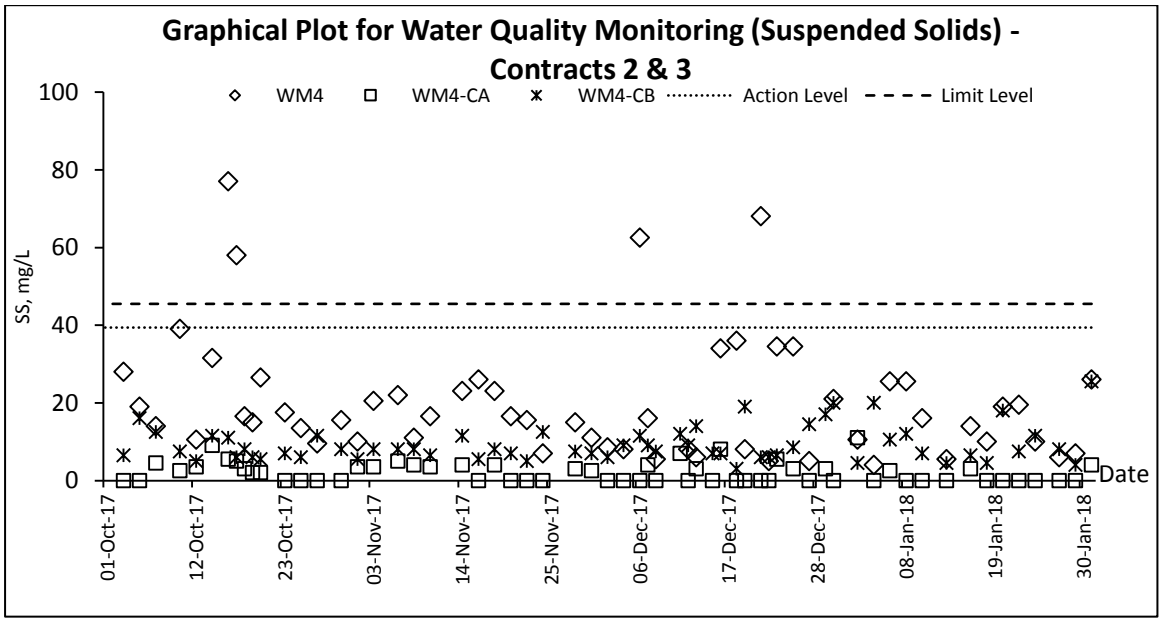


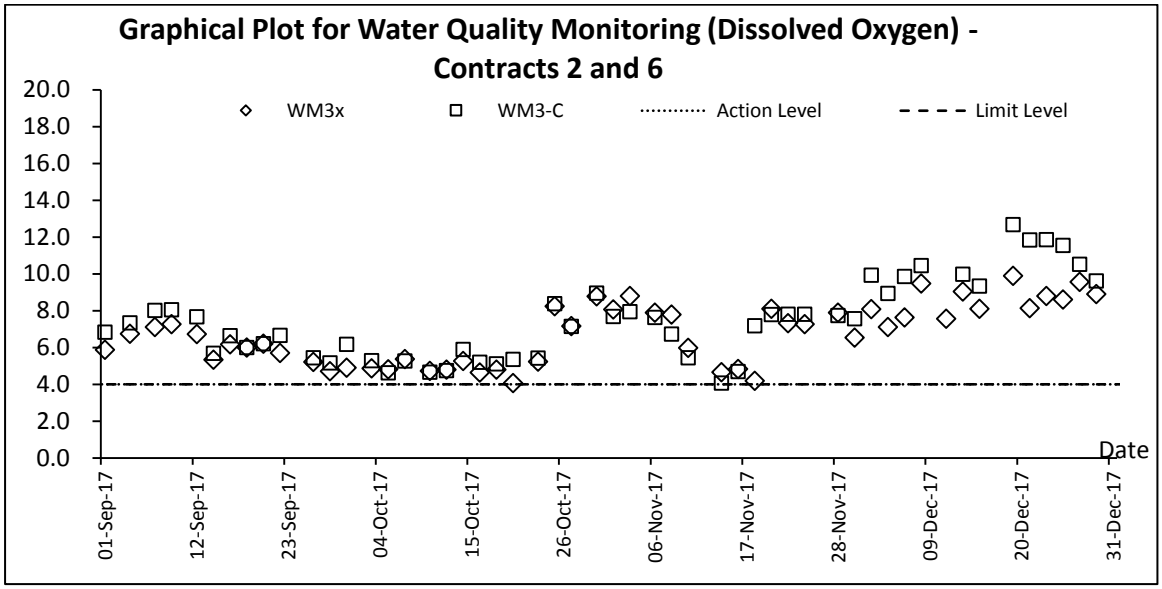


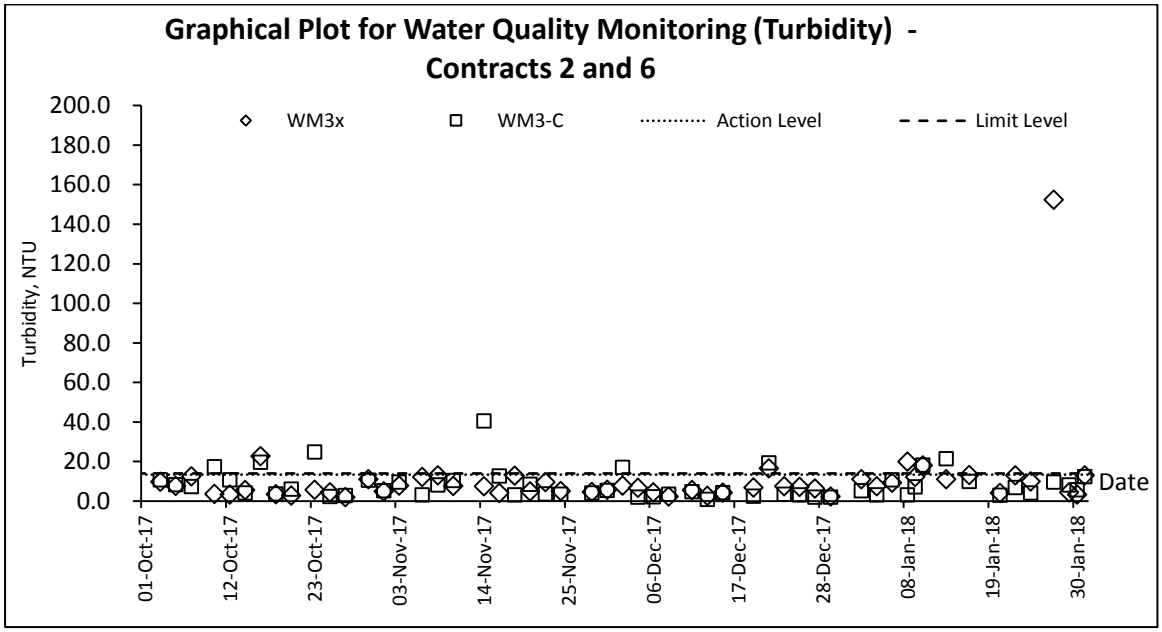


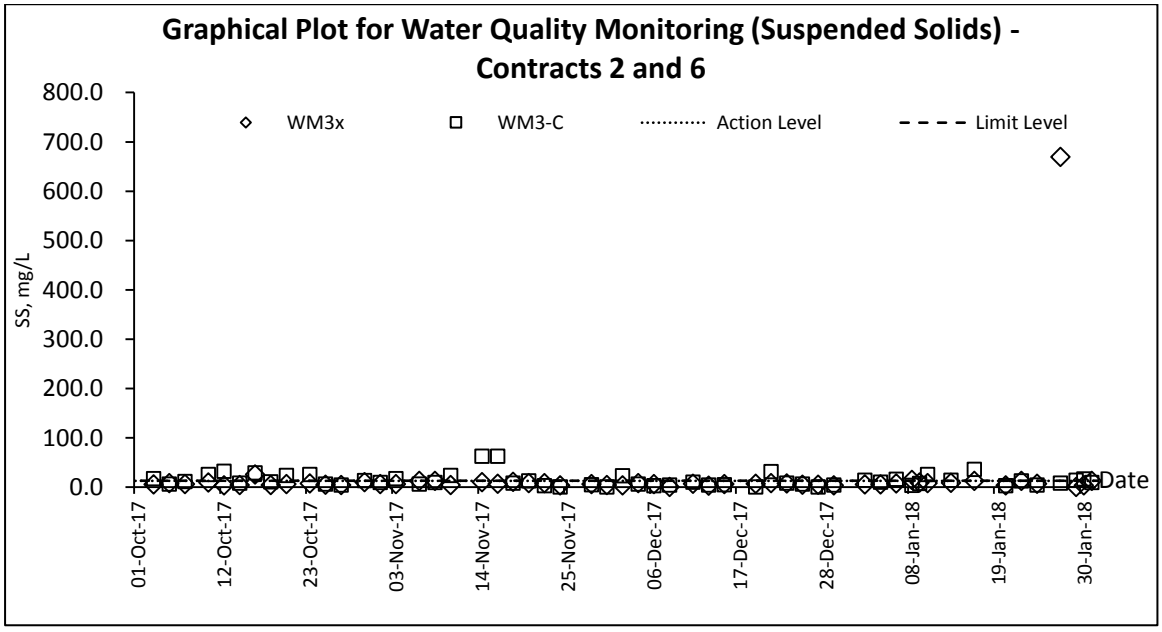

Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) - Contracts 2 and 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
DO, mg/L
Date
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
01-Sep-17
09-Sep-17
17-Sep-17
25-Sep-17
03-Oct-17
11-Oct-17
19-Oct-17
27-Oct-17
04-Nov-17
12-Nov-17
20-Nov-17
28-Nov-17
06-Dec-17
14-Dec-17
22-Dec-17
30-Dec-17

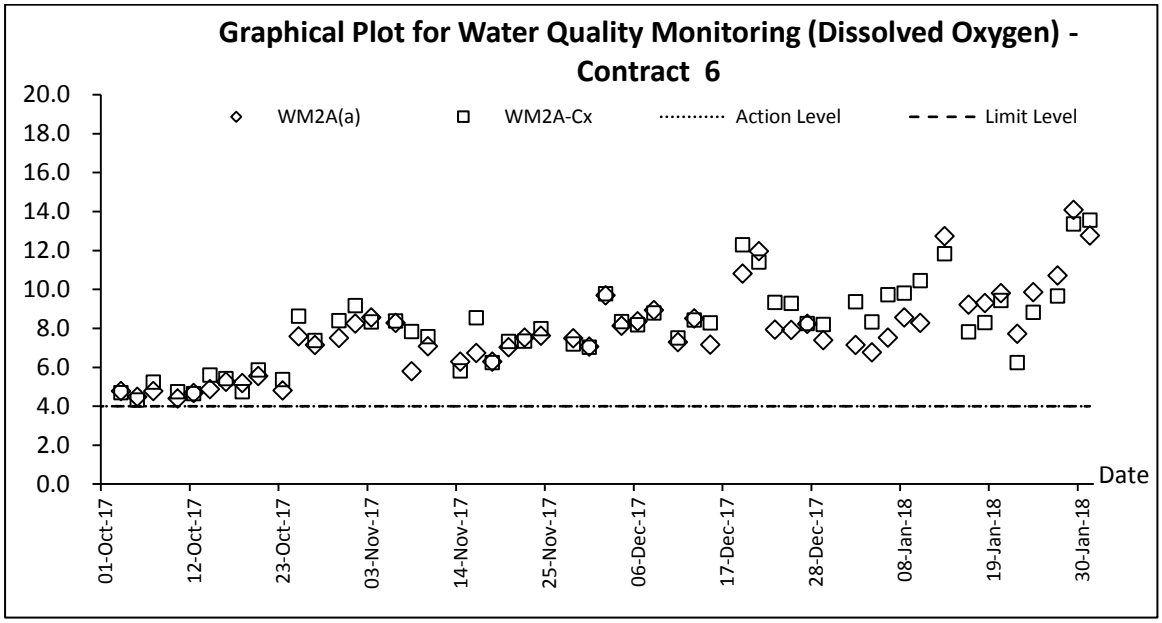

Graphical Plot for Water Quality Monitoring (Turbidity) - Contracts 2 and 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
Turbidity, NTU
Date
200.0
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
01-Oct-17
12-Oct-17
23-Oct-17
03-Nov-17
14-Nov-17
25-Nov-17
06-Dec-17
17-Dec-17
28-Dec-17
08-Jan-18
19-Jan-18
30-Jan-18

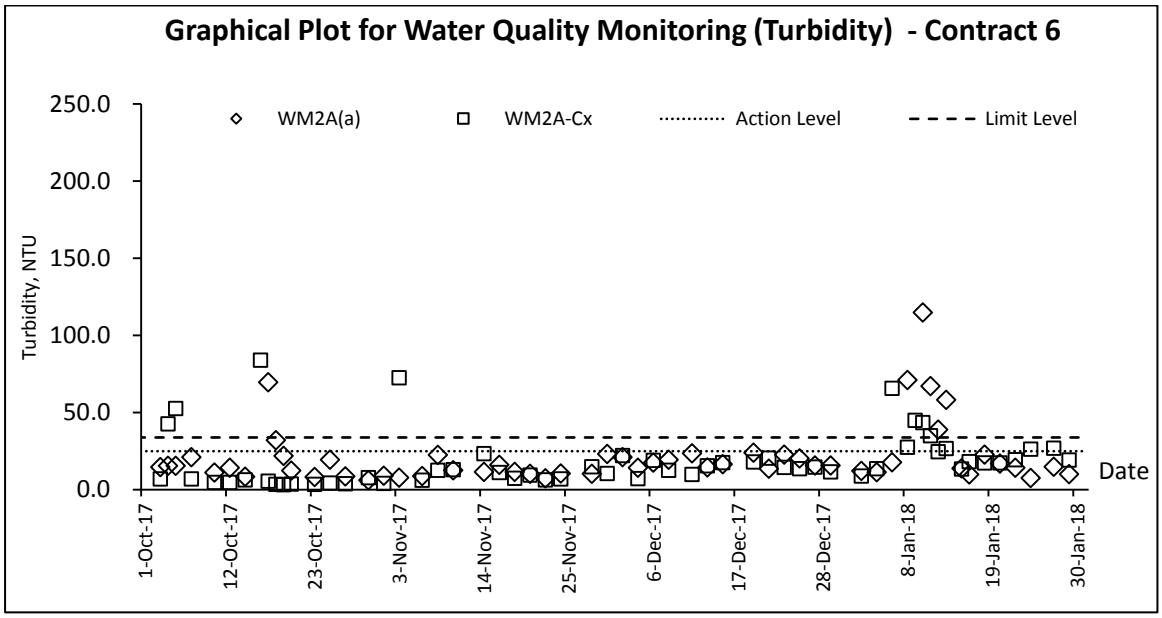

Graphical Plot for Water Quality Monitoring (Suspended Solids) - Contracts 2 & 3
WM4
WM4-CA
WM4-CB
Action Level
Limit Level
SS, mg/L
Date
100
80
60
40
20
0
01-Oct-17
12-Oct-17
23-Oct-17
03-Nov-17
14-Nov-17
25-Nov-17
06-Dec-17
17-Dec-17
28-Dec-17
08-Jan-18
19-Jan-18
30-Jan-18

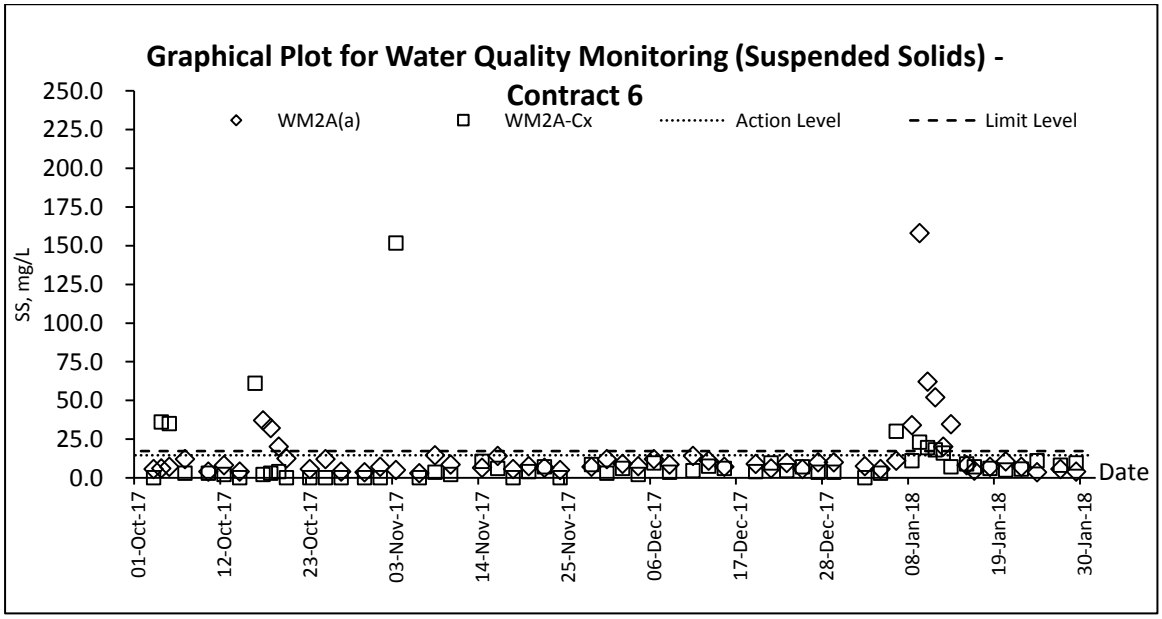

Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) - Contracts 2 and 6
WM3x
WM3-C
Action Level
Limit Level
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Date
01-Sep-17
12-Sep-17
23-Sep-17
04-Oct-17
15-Oct-17
26-Oct-17
06-Nov-17
17-Nov-17
28-Nov-17
09-Dec-17
20-Dec-17
31-Dec-17


Graphical Plot for Water Quality Monitoring (Turbidity) - Contracts 2 and 6
WM3x
WM3-C
Action Level
Limit Level
Turbidity, NTU
200.0
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
Date
01-Oct-17
12-Oct-17
23-Oct-17
03-Nov-17
14-Nov-17
25-Nov-17
06-Dec-17
17-Dec-17
28-Dec-17
08-Jan-18
19-Jan-18
30-Jan-18


Graphical Plot for Water Quality Monitoring (Suspended Solids) - Contracts 2 and 6
WM3x
WM3-C
Action Level
Limit Level
SS, mg/L
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
Date
01-Oct-17
12-Oct-17
23-Oct-17
03-Nov-17
14-Nov-17
25-Nov-17
06-Dec-17
17-Dec-17
28-Dec-17
08-Jan-18
19-Jan-18
30-Jan-18


Graphical Plot for Water Quality Monitoring (Dissolved Oxygen) - Contract 6
WM2A(a)
WM2A-Cx
Action Level
Limit Level
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Date
01-Oct-17
12-Oct-17
23-Oct-17
03-Nov-17
14-Nov-17
25-Nov-17
06-Dec-17
17-Dec-17
28-Dec-17
08-Jan-18
19-Jan-18
30-Jan-18


Graphical Plot for Water Quality Monitoring (Turbidity) - Contract 6
WM2A(a)
WM2A-Cx
Action Level
Limit Level
Turbidity, NTU
250.0
200.0
150.0
100.0
50.0
0.0
Date
1-Oct-17
12-Oct-17
23-Oct-17
3-Nov-17
14-Nov-17
25-Nov-17
6-Dec-17
17-Dec-17
28-Dec-17
8-Jan-18
19-Jan-18
30-Jan-18


Graphical Plot for Water Quality Monitoring (Suspended Solids) - Contract 6
WM2A(a)
WM2A-Cx
Action Level
Limit Level
SS, mg/L
250.0
225.0
200.0
175.0
150.0
125.0
100.0
75.0
50.0
25.0
0.0
Date
01-Oct-17
12-Oct-17
23-Oct-17
03-Nov-17
14-Nov-17
25-Nov-17
06-Dec-17
17-Dec-17
28-Dec-17
08-Jan-18
19-Jan-18
30-Jan-18

Appendix K

Meteorological Data

Date		Weather	Total Rainfall (mm)	Ta Kwu Ling Station			
				Mean Air Temp. (°C)	Wind Speed (km/h)	Mean Relative Humidity (%)	Wind Direction
1-Jan-18	Mon	Mainly cloudy.	0	16.1	5.9	70	E/NE
2-Jan-18	Tue	Moderate east to northeasterly winds	0	16.9	6.4	74	E/NE
3-Jan-18	Wed	There will also be one or two light rain patches.	0	20.8	7.8	66	E/NE
4-Jan-18	Thu	Moderate east to northeasterly winds	0.2	19.5	9.3	75.5	E/NE
5-Jan-18	Fri	Moderate east to northeasterly winds	0.2	19.4	4.5	76	E
6-Jan-18	Sat	Fresh northerly winds	3.7	15.4	6.9	83.2	E
7-Jan-18	Sun	Cloudy to overcast with a few rain patches.	16.2	17.1	13.4	86.7	E
8-Jan-18	Mon	Cloudy to overcast with a few rain patches.	11.6	13.1	8.5	89.5	N/NW
9-Jan-18	Tue	Cloudy to overcast with a few rain patches.	9.9	7.8	14.9	72.5	N/NW
10-Jan-18	Wed	Fine and dry.	Trace	12.5	10.8	34.2	N/NW
11-Jan-18	Thu	Fine and dry.	Trace	13.4	9.7	37.5	N
12-Jan-18	Fri	Moderate to fresh east to northeasterly winds	0	10.8	12.4	39	N/NW
13-Jan-18	Sat	Fine and dry.	0	10.1	9.8	56	E/NE
14-Jan-18	Sun	Hazy with sunny periods. Warm during the day. Light winds.	0	13.2	6.9	59	E/NE
15-Jan-18	Mon	Mainly fine but hazy. Light winds	0	14.5	7.2	67	E/NE
16-Jan-18	Tue	Hazy with sunny periods. Warm during the day. Light winds.	0	17.4	4.5	69.2	N/NW
17-Jan-18	Wed	Mainly fine but hazy. Light winds	0	17.8	6.1	66	N/NW
18-Jan-18	Thu	Fresh easterly winds, strong offshore.	0	18.4	6.5	74	N/NE
19-Jan-18	Fri	Moderate to fresh easterly winds	0.8	18.3	8	68.2	E
20-Jan-18	Sat	Mainly cloudy	Trace	20.5	6.9	75.3	E/NE
21-Jan-18	Sun	Hazy with sunny periods. Warm during the day. Light winds.	0	19.3	5.3	78.2	E/NE
22-Jan-18	Mon	Mainly fine but hazy. Light winds	0	19.2	5	80	E/NE
23-Jan-18	Tue	Mainly fine. Moderate to fresh easterly winds.	0	19.3	7	81.5	E/SE
24-Jan-18	Wed	One or two light rain patches tonight.	0	18.6	12.1	73.7	E
25-Jan-18	Thu	Mainly cloudy	0	18	14.5	74	E/NE
26-Jan-18	Fri	Mainly fine. Moderate to fresh easterly winds.	Trace	17.4	6.5	82	E/NE
27-Jan-18	Sat	One or two light rain patches tonight.	Trace	15	8.3	80.4	N/NW
28-Jan-18	Sun	Moderate to fresh north to northeasterly winds.	0	13	15	77	N/NW
29-Jan-18	Mon	Cloudy to overcast and cold with one or two rain patches.	0.1	7.4	15	77	N/NW
30-Jan-18	Tue	Mainly cloudy with one or two light rain patches at first.	0.2	6.2	11.9	83.7	N/NW
31-Jan-18	Wed	Mainly fine and dry.	19.3	6.9	8.8	91.5	N/NW

Appendix L

Waste Flow Table

Name of Department : CEDD **Contract No./ Work Order No. :** CV/2012/08

Appendix I - Monthly Summary Waste Flow Table for 2018

(All quantities shall be rounded off to 3 decimal places)

Month	Actual Quantities of Inert C&D Materials Generated / Imported (in '000 m3)						Actual Quantities of Other C&D Materials / Wastes Generated				
	Total Quantities Generated [a+b+c+d]	Broken Concrete (including rock for recycling into aggregates) (a)	Reused in the Contract (b)	Reused in Other Projects (c)	Disposed as Public Fill (d)	Imported C&D Material	Metal (in '000kg)	Paper/ Cardboard Packaging (in '000kg)	Plastic (Recycled) (in '000kg)	Chemical Waste (in '000kg)	Others (e.g. General Refuse etc.) (in '000 m3) (in '000m3)
January	86.6400	0.0000	0.0000	5.2900	81.3500	1.6570	45.0000	0.3100	2.8000	4.5760	0.6575
February	0.0000										
March	0.0000										
April	0.0000										
May	0.0000										
June	0.0000										
Half-year total	86.6400	0.0000	0.0000	5.2900	81.3500	1.6570	45.0000	0.3100	2.8000	4.5760	0.6575
July	0.0000										
August	0.0000										
September	0.0000										
October	0.0000										
November	0.0000										
December	0.0000										
Yearly Total	86.6400	0.0000	0.0000	5.2900	81.3500	1.6570	45.0000	0.3100	2.8000	4.5760	0.0000

(All quantities shall be rounded off to 3 decimal places)

Year	) Materials Generated / Imported (in '000 m3)					Actual Quantities of Other C&D Materials / Wastes Generated					
	Total Quantities Generated [a+b+c+d]	Broken Concrete (including rock for recycling into aggregates) (a)	Reused in the Contract (b)	Reused in Other Projects (c)	Disposed as Public Fill (d)	Imported C&D Material	Metal (in '000kg)	Paper/ Cardboard Packaging (in '000kg)	Plastic (Recycled) (in kg)	Chemical Waste (in '000kg)	Others (e.g. General Refuse etc.) (in '000 m3) (in '000m3)
2013	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	220.6270	0.0000	0.0000	0.0000	0.0000
2014	425.4406	0.0000	2.7362	376.3945	46.3099	5.6245	3.2100	0.4390	0.0070	10.8800	2.2609
2015	570.9459	0.0000	20.8159	543.2162	6.9138	4.5492	37.6310	3.9220	11.9700	16.1920	1.1696
2016	905.0989	0.0000	7.4372	427.7834	469.8783	24.8350	430.5200	3.8500	18.7262	34.2936	1.9720
2017	741.9482	0.0000	8.0385	175.6792	558.2305	78.3865	1681.8000	4.0700	30.5175	48.7906	5.9610
2018	81.3500	0.0000	0.0000	5.2900	81.3500	1.6570	45.0000	0.3100	2.8000	4.5760	0.6575
Total	2724.7836	0.0000	39.0278	1528.3634	1162.6825	115.0522	2418.7880	12.5910	64.0207	114.7322	12.0210

Remark:

1) Density of C&D material to be 2.2 metric ton/m3
2) Density of General Refuse to be 1.6 metric ton/m3
3) Density of Spent Oil to be 0.88 metric ton/m3

Name of Department: CEDD

Contract No.: CV/2012/09

Monthly Summary Waste Flow Table for 2018 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in m^3)	(in '000m^3)
Jan	3.089	0.304	0.060	0.000	2.725	0.923	0.000	0.000	0.000	0.000	0.150
Feb											
Mar											
Apr											
May											
Jun											
Sub-total	3.089	0.304	0.060	0.000	2.725	0.923	0.000	0.000	0.000	0.000	0.150
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	3.089	0.304	0.060	0.000	2.725	0.923	0.000	0.000	0.000	0.000	0.150

Note:

1. Assume the density of soil fill is 2 ton/m^3.
2. Assume the density of rock and broken concrete is 2.5 ton/m^3.
3. Assume each truck of C&D wastes is 5m^3.
4. The inert C&D materials except slurry and bentonite are disposed at Tuen Mun 38.
5. The slurry and bentonite are disposed at Tseung Kwun O 137.
6. The non-inert C&D wastes are disposed at NENT.
7. Assume the density of metal is 7,850 kg/m^3.
8. Assume the density of plastic is 941 kg/m^3.
9. Assume the density of paper is 800 kg/m^3.

Forecast of Total Quantities of C&D Materials to be Generated from the Contract										
Total Quantity Generated	**Hard Rock and Large Broken Concrete**	**Reused in the Contract**	**Reused in other Projects**	**Diposal as Public Fill**	**Imported Fill**	**Metals**	**Paper/card board packaging**	**Plastics (see Note 3)**	**Chemical Waste**	**Others, e.g. general refuse**
(in '000m^3)	**(in '000m^3)**	**(in '000m^3)**	**(in '000m^3)**	**(in '000m^3)**	**(in '000m^3)**	**(in '000m^3)**	**(in '000m^3)**	**(in '000m^3)**	**(in '000m^3)**	**(in '000m^3)**
52.5	5.2	12.3	0.0	35.0	41.8	5.0	1.0	1.0	0.5	44.8

Notes:

(1) The performance targets are given in PS Clause 6(14).

(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

(4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works if equal to or exceed 50,000 m^3.

SUMMARY TABLE FOR WORK PROCESSES OR ACTIVITIES REQUIRING TIMBER FOR TEMPORARY WORKS

Contract No.: CV/2012/09

Contract Title: Liantang /Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works - Contract 3

Item No.	Description of Works Process or Activity [see note (a) below]	Justifications for Using Timber in Temporary Construction Works	Est. Quantities of Timber Used (m^3)	Actual Quantities Used (m^3)	Remarks
1	Formwork for concreting the Stem wall bay4 of noise barrier NB67	Easy handling by manpower	4.58	4.37	
		Total Estimated Quantity of Timber Used	4.58		

Notes:

(a) The Contractor shall list out all the work items requiring timber for use in temporary construction works. Several minor work items may be grouped into one for ease of updating.

(b) The summary table shall be submitted to the Engineer's Representative monthly together with the Waste Flow Table for review and monitoring in accordance with the PS Clause 25.24(11)..

Appendix A

Name of Department: CEDD

Contract No.: NE/2014/02

Monthly Summary Waste Flow Table for 2018

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
2016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2016	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Jan-18	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Feb-18											
Mar-18											
Apr-18											
May-18											
Jun-18											
Jul-18											
Aug-18											
Sep-18											
Oct-18											
Nov-18											
Dec-18											
Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Forecast of Total Quantities of C&D Materials to be Generated from the Contract*										
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m^3)
0.500	0.000	0.000	0.000	0.500	0.000	0.500	0.200	0.000	0.000	0.200

Notes :

(1) The performance targets are given in PS Clause 1.84(14).

(2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Sites.

(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging materials.

(4) Estimate 6m3 capacity per dump truck

Monthly Summary Waste Flow Table for 2018 (year)

Name of Person completing the record: K.M. Lui (EO)

Project : Liangtang / Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works – Contract 6 Contract No.: CV/2013/08

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 m^3)
Jan	4.152	0	0.629	1.947	1.576	0	0	0.240	0	0	0.892
Feb											
Mar											
Apr											
May											
Jun											
Sub-total	4.152	0.000	0.629	1.947	1.576	0.000	0.000	0.240	0.000	0.000	0.892
Jul											
Aug											
Sep											
Oct											
Nov											
Dec											
Total	1002.546	0.000	163.856	272.590	566.101	53.939	0.000	6.619	0.007	34.045	9.643

Notes: (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.

(2) Plastics refer to plastic bottles/containers, plastic sheets/ foam from packaging materials.

(3) Broken concrete for recycling into aggregates.

Appendix I

MONTHLY SUMMARY WASTE FLOW TABLE

Name of Department: CEDD

Contract Title: Liantang/ Heung Yuen Wai Boundary Control Point Site Formation and Infrastructure Works – Contract 7

Contract No.: NE/2014/03

Monthly Summary Waste Flow Table for 2018 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of Non-Inert C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/cardboard packaging	Plastic (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m^3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000m3)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m3)
Jan	0.015	0	0	0	0.015	0	14.5	0.5	0.001	0	0.15
Feb											
Mar											
Apr											
May											
June											
Sub-total	0.015	0	0	0	0.015	0	14.5	0.5	0.001	0	0.15
July											
Aug											
Sept											
Oct											
Nov											
Dec											
Total	0.015	0	0	0	0.015	0	14.5	0.5	0.001	0	0.150

Notes: (1) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
(2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.

Architectural Services Department	Form No. D/OI.03/09.002

Contract No. / Works Order No.: - SSC505

Monthly Summary Waste Flow Table for 2018 [year] [to be submitted not later than the 15th day of each month following reporting month]

(All quantities shall be rounded off to 3 decimal places.)

Month	Actual Quantities of Inert Construction Waste Generated Monthly				
	(a)=(b)+(c)+(d)+(e) Total Quantity Generated	(b) Broken Concrete (see Note 4)	(c) Reused in the Contract	(d) Reused in other Projects	(e) Disposed of as Public Fill
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)
Jan	5.298	0.646	0.160	0.000	4.492
Feb					
Mar					
Apr					
May					
Jun					
Sub-total	5.298	0.646	0.160	0.000	4.492
Jul					
Aug					
Sep					
Oct					
Nov					
Dec					
Total	5.298	0.646	0.160	0.000	4.492

Month	Actual Quantities of Non-inert Construction Waste Generated Monthly												
	Timber		Metals		Paper/ cardboard packaging		Plastics (see Note 3)		Chemical Waste		Other Recyclable Materials (see Page 3)		General Refuse disposed of at Landfill
	(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000m^3)
	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated	recycled	generated
Jan	0.000	0.000	375.870	375.870	0.220	0.220	0.032	0.032	0.000	0.000	0.000	0.000	1.918
Feb													
Mar													
Apr													
May													
Jun													
Sub-total	0.000	0.000	375.870	375.870	0.220	0.220	0.032	0.032	0.000	0.000	0.000	0.000	1.918
Jul													
Aug													
Sep													
Oct													
Nov													
Dec													
Total	0.000	0.000	375.870	375.870	0.220	0.220	0.032	0.032	0.000	0.000	0.000	0.000	1.918

Description of mode and details of recycling if any for the month e.g. XX kg of used timber was sent to YY site for transformation into fertilizers					
220 kg of papers were sent to Chung Fat for recycling.	32 kg of plastic bottles were sent to Action Health for recycling.	375.87 tons of scrap metals were sent to Sam Kee Metal Co. Ltd. and Win Link Trading Ltd. for recycling.	1,291.62 tons of broken concrete were sent TRA for recycling.		

Notes:
(1) The performance targets are given in the Particular Specification on Environmental Management Plan.
(2) The waste flow table shall also include construction waste that are specified in the Contract to be imported for use at the site.
(3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
(4) Broken concrete for recycling into aggregates.
(5) If necessary, use the conversion factor: 1 full load of dumping truck being equivalent to 6.5 m^3 by volume.

Appendix M

Implementation Schedule for Environmental Mitigation Measures

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
Air Quality Impact (Construction)							
3.6.1.1	2.1	**General Dust Control Measures** The following dust suppression measures should be implemented: ■ Frequent water spraying for active construction areas (4 times per day for active areas in Po Kak Tsai and 8 times per day for all other active areas), including areas with heavy construction and slope cutting activities ■ 80% of stockpile areas should be covered by impervious sheets ■ Speed of trucks within the site should be controlled to about 10 km/hr ■ All haul roads within the site should be paved to avoid dust emission due to vehicular movement	To minimize adverse dust emission generated from various construction activities of the works sites	Contractor	Construction Works Sites	During Construction	EIA Recommendation and Air Pollution Control (Construction Dust) Regulation
3.6.1.2	2.1	**Best Practice for Dust Control** The relevant best practices for dust control as stipulated in the Air Pollution Control (Construction Dust) Regulation should be adopted to further reduce the construction dust impacts of the Project. These best practices include: *Good site management* ■ The Contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. ■ Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimize the release of visible dust emission. ■ Any piles of materials accumulated on or around the work areas should be cleaned up regularly. ■ Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimizing generation of fugitive dust emissions. ■ The material should be handled properly to prevent fugitive dust emission before cleaning. *Disturbed Parts of the Roads* ■ Each and every main temporary access should be paved with	To minimize adverse dust emission generated from various construction activities of the works sites	Contractor	Construction Works Sites	During Construction	EIA Recommendation and Air Pollution Control (Construction Dust) Regulation

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		concrete, bituminous hardcore materials or metal plates and kept clear of dusty materials; or ■ Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet. *Exposed Earth* ■ Exposed earth should be properly treated by compaction, hydroseeding, vegetation planting or seating with latex, vinyl, bitumen within six months after the last construction activity on the site or part of the site where the exposed earth lies. *Loading, Unloading or Transfer of Dusty Materials* ■ All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet. *Debris Handling* ■ Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides. ■ Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped. *Transport of Dusty Materials* ■ Vehicle used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards. *Wheel washing* ■ Vehicle wheel washing facilities should be provided at each construction site exit. Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. *Use of vehicles* ■ Immediately before leaving the construction site, every vehicle should be washed to remove any dusty materials from its body and wheels. ■ Where a vehicle leaving the construction site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle.				

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		Site hoarding ■ Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit. *Blasting* ■ The areas within 30m from the blasting area should be wetted with water prior to blasting.					
Air Quality Impact (Operation)							
3.5.2.2	2.2	The following odour containment and control measures will be provided for the proposed sewage treatment work at the BCP site: ■ The treatment work will be totally enclosed. Negative pressure ventilation will be provided within the enclosure to avoid any fugitive odorous emission from the treatment work. ■ Further odour containment will be achieved by covering or confining the sewage channels, sewage tanks, and equipment with potential odour emission. ■ Proper mixing will be provided at the equalization and sludge holding tanks to prevent sewage septicity. ■ Chemical or biological deodorisation facilities with a minimum odour removal efficiency of 90% will be provided to treat potential odorous emissions from the treatment plant including sewage channels / tanks, filter press and screening facilities so as to minimize any potential odour impact to the nearby ASRs.	To minimize potential odour impact from operation of the proposed sewage treatment work at BCP	DSD	BCP	Operation Phase	EIA recommendation
Noise Impact (Construction)							
4.4.1.4	3.1	**Adoption of Quieter PME** Use of the recommended quieter PME such as those given in the BS5228: Part 1:2009 and presented in **Table 4.14**, which can be found in Hong Kong.	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and Noise Control Ordinance (NCO)

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
4.4.1.4	3.1	**Use of Movable Noise Barrier** The use of movable barrier for certain PME can further alleviate the construction noise impacts. In general, a 5 dB(A) reduction for movable PME and 10 dB(A) for stationary PME can be achieved depending on the actual design of the movable noise barrier. The Contractor shall be responsible for design of the movable noise barrier with due consideration given to the size of the PME and the requirement for intercepting the line of sight between the NSRs and PME. Barrier material with surface mass in excess of 7 kg/m^2 is recommended to achieve the predicted screening effect.	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO
4.4.1.4	3.1	**Use of Noise Enclosure/ Acoustic Shed** The use of noise enclosure or acoustic shed is to cover stationary PME such as air compressor and concrete pump. With the adoption of the noise enclosure, the PME could be completely screened, and noise reduction of 15 dB(A) can be achieved according to the GW-TM.	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO
4.4.1.4	3.1	**Use of Noise Insulating Fabric** Noise insulating fabric can be adopted for certain PME (e.g. drill rig, pilling auger etc). The insulating fabric should be lapped such that there are no openings or gaps on the joints. Technical data from manufacturers state that by using the Fabric, a noise reduction of over 10 dB(A) can be achieved on noise level.	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
4.4.1.4	3.1	**Good Site Practice** The good site practices listed below should be followed during each phase of construction: • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme; • Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction programme; • Mobile plant, if any, should be sited as far from NSRs as possible; • Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.	To minimize the construction air-borne noise impact	Contractors	Construction Work Sites	During Construction	EIA recommendation, EIAO and NCO
Noise Impact (Operation)							
		Road Traffic Noise					
Table 4.42 and Figure 4.20.1 to 4.20.4	3.2	Erection of noise barrier/ enclosure along the viaduct section.	To minimize the road traffic noise along the connecting road of BCP	Contractor	Loi Tung and Fanling Highway Interchange	Before Operation	EIAO and NCO
		Fixed Plant Noise					
Table 4.46	3.2	Specification of the maximum allowable sound power levels of the proposed fixed plants during daytime and night-time.	To minimize the fixed plant noise impact	Managing Authority of the buildings / Contractor	BCP, Administration Building and all ventilation buildings	Before Operation	EIA recommendation, EIAO and NCO

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
4.5.2.4	3.2	The following noise reduction measures shall be considered as far as practicable during operation: • Choose quieter plant such as those which have been effectively silenced; • Include noise levels specification when ordering new plant (including chillier and E/M equipment); • Locate fixed plant/louver away from any NSRs as far as practicable; • Locate fixed plant in walled plant rooms or in specially designed enclosures; • Locate noisy machines in a basement or a completely separate building; • Install direct noise mitigation measures including silencers, acoustic louvers and acoustic enclosure where necessary; and • Develop and implement a regularly scheduled plant maintenance programme so that equipment is properly operated and serviced in order to maintain a controlled level of noise.	To minimize the fixed plant noise impact	Managing Authority of the buildings / Contractor	BCP, Administration Building and all ventilation buildings	Before Operation	EIAO and NCO
Water Quality Impact (Construction)							
5.6.1.1	4.1	**Construction site runoff and drainage** The site practices outlined in ProPECC Note PN 1/94 should be followed as far as practicable in order to minimise surface runoff and the chance of erosion. The following measures are recommended to protect water quality and when properly implemented should be sufficient to adequately control site discharges so as to avoid water quality impacts: ▪ At the start of site establishment, perimeter cut-off drains to direct off-site water around the site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities. The design of the temporary on-site drainage system should be undertaken by the Contractor prior to the commencement of construction. ▪ The dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas.	To control site runoff and drainage; prevent high sediment loading from reaching the nearby watercourses	Contractor	Construction Works Sites	Construction Phase	Practice Note for Professional Persons on Construction Site Drainage (ProPECC Note PN 1/94)

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		Temporary ditches should be provided to facilitate the runoff discharge into stormwater drainage system through a sediment/silt trap. The sediment/silt traps should be incorporated in the permanent drainage channels to enhance deposition rates, if practical. ▪ Sand/silt removal facilities such as sand/silt traps and sediment basins should be provided to remove sand/silt particles from runoff to meet the requirements of the TM standards under the WPCO. The design of efficient silt removal facilities should be based on the guidelines in Appendix A1 of ProPECC Note PN 1/94. Sizes may vary depending upon the flow rate. The detailed design of the sand/silt traps should be undertaken by the Contractor prior to the commencement of construction. ▪ All drainage facilities and erosion and sediment control structures should be regularly inspected and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Deposited silt and grit should be regularly removed, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. ▪ Measures should be taken to minimize the ingress of site drainage into excavations. If excavation of trenches in wet periods is necessary, they should be dug and backfilled in short sections wherever practicable. Water pumped out from foundation excavations should be discharged into storm drains via silt removal facilities. ▪ If surface excavation works cannot be avoided during the wet season (April to September), temporarily exposed slope/soil surfaces should be covered by tarpaulin or other means, as far as practicable, and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Interception channels should be provided (e.g. along the crest/edge of the excavation) to prevent storm runoff from washing across exposed soil surfaces. Arrangements should always be in place to ensure that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm. Other measures that need to be implemented before, during and after rainstorms are summarized in ProPECC Note PN 1/94. ▪ The overall slope of the site should be kept to a minimum to reduce					

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		the erosive potential of surface water flows. ▪ All vehicles and plant should be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and sited wheel washing facility should be provided at construction site exit where practicable. Wash-water should have sand and silt settled out and removed regularly to ensure the continued efficiency of the process. The section of access road leading to, and exiting from, the wheel-wash bay to the public road should be paved with sufficient backfall toward the wheel-wash bay to prevent vehicle tracking of soil and silty water to public roads and drains. ▪ Open stockpiles of construction materials or construction wastes on-site should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system. ▪ Manholes (including newly constructed ones) should be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and stormwater runoff being directed into foul sewers. ▪ Precautions should be taken at any time of the year when rainstorms are likely. Actions should be taken when a rainstorm is imminent or forecasted and actions to be taken during or after rainstorms are summarized in Appendix A2 of ProPECC Note PN 1/94. Particular attention should be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes. ▪ Bentonite slurries used in piling or slurry walling should be reconditioned and reused wherever practicable. Temporary enclosed storage locations should be provided on-site for any unused bentonite that needs to be transported away after all the related construction activities are completed. The requirements in ProPECC Note PN 1/94 should be adhered to in the handling and disposal of bentonite slurries.					
5.6.1.1	4.1	**Good site practices for works within water gathering grounds** The following conditions should be complied, if there is any works to be carried out within the water gathering grounds:	To minimize water quality impacts to the water gathering grounds	Contractor	Construction Works Sites within the water gathering	Construction Phase	ProPECC Note PN 1/94

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		▪ Adequate measures should be implemented to ensure no pollution or siltation occurs to the catchwaters and catchments. ▪ No earth, building materials, oil or fuel, soil, toxic materials or any materials that may possibly cause contamination to water gathering grounds are allowed to be stockpiled on site. ▪ All surplus spoil should be removed from water gathering grounds as soon as possible. ▪ Temporary drains with silt traps should be constructed at the site boundary before the commencement of any earthworks. ▪ Regular cleaning of silt traps should be carried out to ensure proper operation at all time. ▪ All excavated or filled surfaces which have the risk of erosion should always be protected form erosion. ▪ Facilities for washing the wheels of vehicles before leaving the site should be provided. ▪ Any construction plant which causes pollution to catchwaters or catchments due to the leakage of oil or fuel should be removed off site immediately. ▪ No maintenance activities which may generate chemical wastes should be undertaken in the water gathering grounds. Vehicle maintenance should be confined to designated paved areas only and any spillages should be cleared up immediately using absorbents and waste oils should be collected in designated tanks prior to disposal off site. All storm water run-off from these areas should be discharged via oil/petrol separators and sand/silt removal traps. ▪ Any soil contaminated with fuel leaked from plant should be removed off site and the voids arising from removal of contaminated soil should be replaced by suitable material approved by the Director of Water Supplies. ▪ Provision of temporary toilet facilities and use of chemicals or insecticide of any kind are subject to the approval of the Director of Water Supplies. ▪ Drainage plans should be submitted for approval by the Director of			grounds		

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		Water Supplies. ▪ An unimpeded access through the waterworks access road should always be maintained. ▪ Earthworks near catchwaters or streamcourses should only be carried out in dry season between October and March, ▪ Advance notice must be given before the commencement of works on site quoting WSD's approval letter reference.					
5.6.1.2	4.1	**Good site practices of general construction activities** Construction solid waste, debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering any nearby stormwater drain. Stockpiles of cement and other construction materials should be kept covered when not being used. Oils and fuels should only be stored in designated areas which have pollution prevention facilities. To prevent spillage of fuels and solvents to any nearby stormwater drain, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund should be drained of rainwater after a rain event.	To minimize water quality impacts	Contractor	All construction works sites	Construction phase	EIA Recommendation
5.6.1.3	4.1	**Sewage effluent from construction workforce** Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site where necessary to handle sewage from the workforce. A licensed contractor should be employed to provide appropriate and adequate portable toilets and be responsible for appropriate disposal and maintenance.	To minimize water quality impacts	Contractor	All construction works sites with on-site sanitary facilities	Construction phase	EIA Recommendation and Water Pollution Control Ordinance (WPCO)
5.6.1.4	4.1	**Hydrogeological Impact** Grout injection works would be conducted before blasting, for sealing a limited area around the tunnel with a grout of a suitable strength for controlling the potential groundwater inflows. The pre-injection grouting method would be supplemented by post-injection grouting where necessary to further enhance the groundwater inflow control. On-site treatment for the groundwater ingress pumped out would be required to remove any contamination by grouting materials before discharge off-site.	To minimize water quality impacts	Contractor	Construction works sites of the drill and blast tunnel	Construction phase	EIA Recommendation and WPCO
Water Quality Impact (Operation)							
		No mitigation measure is required.					

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
Sewage and Sewerage Treatment Impact (Construction)							
6.7	5	The sewage generated by the on-site workforce should be collected in chemical toilets and disposed of off-site by a licensed waste collector.	To minimize water quality impacts	Contractor	All construction works sites with on-site sanitary facilities	Construction phase	EIA recommendation and WPCO
Sewage and Sewerage Treatment Impact (Operation)							
6.6.3	5	Sewage generated by the BCP and Chuk Yuen Village Resite will be collected and treated by the proposed on-site sewage treatment facility using Membrane Bioreactor treatment with a portion of the treated wastewater reused for irrigation and flushing within the BCP.	To minimize water quality impacts	DSD	BCP	Operation phase	EIA recommendation and WPCO
6.5.3	5	Sewage generated from the Administration Building will be discharged to the existing local sewerage system.	To minimize water quality impacts	DSD	Administration Building	Operation phase	EIA recommendation and WPCO
Waste Management Implication (Construction)							
7.6.1.1	6	**Good Site Practices** Adverse impacts related to waste management such as potential hazard, air, odour, noise, wastewater discharge and public transport as mentioned in section 3.4.7.2 (ii)(c) of the Study Brief are not expected to arise, provided that good site practices are strictly followed. Recommendations for good site practices during the construction activities include: ▪ Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site ▪ Training of site personnel in proper waste management and chemical handling procedures ▪ Provision of sufficient waste disposal points and regular collection of waste ▪ Dust suppression measures as required under the Air Pollution Control (Construction Dust) Regulation should be followed as far as practicable. Appropriate measures to minimise windblown litter and dust/odour during transportation of waste by covering trucks or in enclosed containers ▪ General refuse shall be removed away immediately for disposal. As	To minimize adverse environmental impact	Contractor	Construction works sites (general)	Construction Phase	EIA recommendation; Waste Disposal Ordinance; Waste Disposal (Chemical Wastes) (General) Regulation; and ETWB TC(W) No. 19/2005, Environmental Management on Construction Site

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		such odour is not anticipated to be an issue to distant sensitive receivers ▪ Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust introduction from public road ▪ Covers and water spraying system should be provided for the stockpiled C&D material to prevent dust impact or being washed away ▪ Designate different locations for storage of C&D material to enhance reuse ▪ Well planned programme for transportation of C&D material to lessen the off-site traffic impact. Well planned delivery programme for offsite disposal and imported filling material such that adverse noise impact from transporting of C&D material is not anticipated ▪ Site practices outlined in ProPECC PN 1/94 "Construction Site Drainage" should be adopted as far as practicable, such as cleaning and maintenance of drainage systems regularly ▪ Provision of cover for the stockpile material, sand bag or earth bund as barrier to prevent material from washing away and entering the drains					
7.6.1.2	6	**Waste Reduction Measures** Good management and control can prevent the generation of a significant amount of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include: ▪ Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal ▪ Encourage collection of aluminium cans by providing separate labelled bins to enable this waste to be segregated from other general refuse generated by the work force ▪ Proper storage and site practices to minimise the potential for damage or contamination of construction materials ▪ Plan and stock construction materials carefully to minimise amount	To reduce the quantity of wastes	Contractor	Construction works sites (General)	Construction Phase	EIA recommendation and Waste Disposal Ordinance

EIA Ref.	EM&A Ref.	Recommended Mitigation Measures	Objectives of the Recommended Measure & Main Concerns to address	Who to implement the measure?	Location of the measure	When to implement the measure?	What requirements or standards for the measure to achieve?
		of waste generated and avoid unnecessary generation of waste ▪ In addition to the above measures, specific mitigation measures are recommended below for the identified waste arising to minimise environmental impacts during handling, transportation and disposal of these wastes.					
7.6.1.3	6	**C&D Materials** In order to minimise impacts resulting from collection and transportation of C&D material for off-site disposal, the excavated materials should be reused on-site as backfilling material as far as practicable. The surplus rock and other inert C&D material would be disposed of at the Government's Public Fill Reception Facilities (PFRFs) at Tuen Mun Area 38 for beneficial use by other projects in the HKSAR as the last resort. C&D waste generated from general site clearance and tree felling works would require disposal to the designated landfill site. Other mitigation requirements are listed below: ▪ A Waste Management Plan should be prepared and implemented in accordance with ETWB TC(W) No. 19/2005 Environmental Management on Construction Site; and ▪ In order to monitor the disposal of C&D material and solid wastes at public filling facilities and landfills, and to control fly-tipping, a trip-ticket system (e.g. ETWB TCW No. 31/2004) should be included.	To minimize impacts resulting from C&D material	Contractor	Construction Works Sites (General)	Construction Phase	EIA recommendation; Waste Disposal Ordinance; and ETWB TCW No. 31/2004
7.6.1.4	6	**General refuse** General refuse should be stored in enclosed bins or compaction units separated from other C&D material. A reputable waste collector is to be employed by the Contractor to remove general refuse from the site separately. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' litter.	To minimize impacts resulting from collection and transportation of general refuse for off-site disposal	Contractor	Construction works sites (General)	Construction phase	Waste Disposal Ordinance and Public Health and Municipal Services Ordinance - Public Cleansing and Prevention of Nuisances Regulation
7.6.1.5	6	**Chemical waste** If chemical wastes are produced at the construction site, the Contractor will be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes*. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical	To minimize impacts resulting from collection and transportation of chemical waste for off-site disposal	Contractor	Construction works sites (General)	Construction phase	Waste Disposal (Chemical Waste) (General) Regulation and Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes

Appendix N

Investigation Report for Exceedance

AUES

Fax Cover Sheet

To	**Mr. Roger Lee**	**Fax No**	**2717 3299**
Company	**Dragages Hong Kong Limited**		
cc			
From	**Nicola Hon**	**Date**	**23 January 2018**
Our Ref	TCS00697/13/300/**F1424a**	**No of Pages**	5 **(Incl. cover sheet)**
RE	**Agreement No. CE 45/2008 Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works Investigation Report of Exceedance of Water Quality at Location WM3x on 8 January 2018 (Contract 2)**		

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Dear Mr. Lee,

Further to the Notification of Exceedance (NOE) ref.:

TCS00694/13/300/F1409 dated 10 January 2018
TCS00694/13/300/F1418 dated 16 January 2018

Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Nicola Hon
Environmental Consultant

Encl.

c.c.	Mr. Clara U (EPD)	Fax:	2685 1133
	Mr. Raymond Leong (CE/BCP, NTEDO, CEDD)	Fax:	3547 1659
	Mr. Edwin Ching (CRE, AECOM)	Fax:	2171 3498
	Mr. Antony Wong (IEC, SMEC)		By e-mail

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Action-United Environmental Services & Consulting
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35-41, Tai Lin Pai Road,
Kwai Chung, New Territories.
Tel (852) 2959-6059 Fax (852) 2959-6079

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Date		8 January 2018	
Location		WM3x	
Time		11:25	
Parameter		Turbidity (NTU)	Suspended Solids (mg/L)
Action Level		13.4 AND 120% of upstream control station of the same day	12.6 AND 120% of upstream control station of the same day
Limit Level		14.0 AND 130% of upstream control station of the same day	12.9 AND 130% of upstream control station of the same day
Measured Level	**WM3-C**	3.3	3.0
	WM3x	**20.0**	**14.5**
Exceedance		**Limit Level**	**Limit Level**
Investigation Results, Recommendations & Mitigation Measures		1. According to the site information provided from the Contractor of C2 (DHK), the construction activities carried out on 8 January 2018 at upstream of WM3x were building internal structure, fitting out and E&M activities, installation of curtain wall, construction of fence wall, permanent drainage and underground utilities for Admin Building and tunnel works at North Portal Site. The relevant works area under C2 and the water monitoring locations are illustrated in ***Figure 1***. 2. According to the site photo taken on 8 January 2018, the water quality observed at WM3x was slightly turbid and at WM3-C was clear. It was noted that the monitored channel was also received the storm water from road surface of Sha Tau Kok Road and the water quality at WM3x was highly affected by the road runoff especially during rainy day. ***(Photos 1 to 2 and Figure 1***) 3. According to weather record from the Observatory, there was heavy rainstorm on 8 January 2018 and the water quality in the river course was deteriorated by rain and stirred up sediment. Moreover, storm water from road surface of Sha Tau Kok Road entering WM3x was noted during rainy day. ***(Photo 1)*** 4. Joint site inspections with AECOM, IEC, DHK and ET were carried out on 5 and 12 January 2018. At Admin Building Site, it was observed that site area was mostly hard paved and wastewater generated from the construction works was limited. The adjacent channel and catch pit receiving the wastewater from Admin Building and upstream area were clear and no adverse water quality impact was identified during site inspection. ***(Photos 3 & 4***) At North Portal Site, it was observed wastewater treatment facilities were in place properly, however, silty effluent from the treatment system was observed on 5 January 2018. DHK had immediately rectified the deficiency and the effluent was visually clear as observed on 12 January 2018. Inspection was also carried out at the downstream area of North Portal Site, it was observed that the water quality outside the discharge point at Loi Tung Steam was visually clear on 5 and 12 January 2018. ***(Photos 5 & 6***) Based on the above investigation, it is considered that the exceedances were likely to be caused by rain and not related to the works under Contract 2. 5. According to Event and Action, the monitoring frequency at WM3x has been increased to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. There were no exceedances triggered in the monitoring result on 9 and 10 January 2018. Nevertheless, the Contractor should continually fully implement the water mitigation	

	measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 23 January 2018

Photo Record

Photo 1
During water sampling on 8 January 2018, slightly turbid water was observed at WM3x.

Photo 2
During water sampling on 8 January 2018, the water quality at WM3-C was clear.

Photo 3
Joint site inspection was conducted on 12 January 2018. It was observed that the water quality in the adjacent channel receiving the wastewater from Admin Building and upstream area were clear.

Photo 4
Joint site inspection was conducted on 12 January 2018. It was observed that the water quality in the catch pit receiving the wastewater from Admin Building and upstream area were clear.

Photo 5
Joint site inspection was conducted on 5 January 2018, the water quality outside the discharge point at downstream Loi Tung Steam was visually clear.

Photo 6
Joint site inspection was conducted on 12 January 2018, the water quality outside the discharge point at downstream Loi Tung Steam was visually clear.

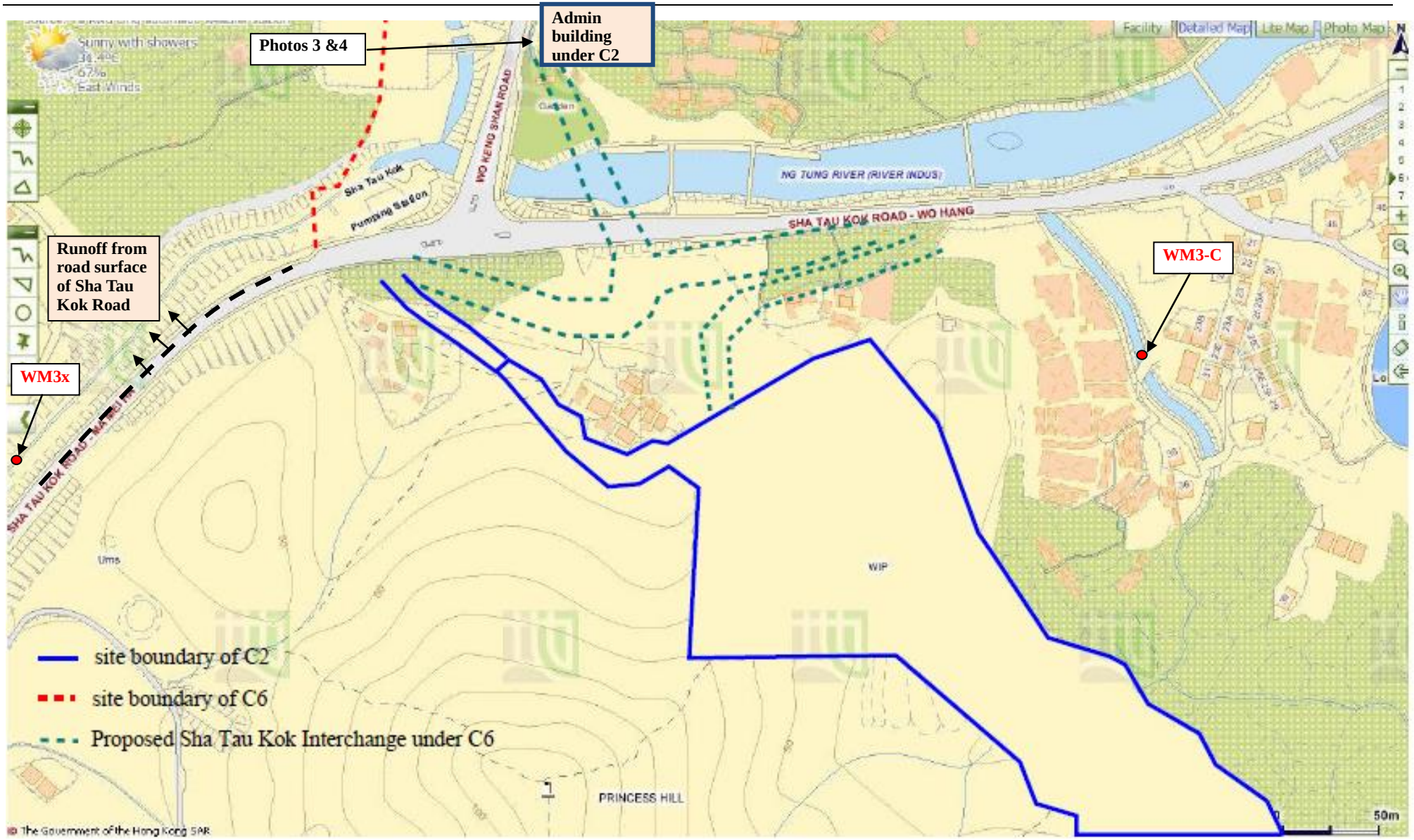

Figure 1 Location Map for Works Area under Contract 2 and Water Quality Monitoring Location

AUES

Fax Cover Sheet

To	**Mr. Vincent Chan**	**Fax No**	**By e-mail**
Company	**CRBC-CEC-Kaden JV**		
cc			
From	**Nicola Hon**	**Date**	**16 January 2018**
Our Ref	TCS00694/13/300/**F1423**	**No of Pages**	5 **(Incl. cover sheet)**
RE	**Agreement No. CE 45/2008 Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works Investigation Report of Exceedance of Water Quality at Location WM3x on 8 January 2018 (Contract 6)**		

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Dear Sir,

Further to the Notification of Exceedance (NOE) ref.:

TCS00694/13/300/F1408 dated 10 January 2018
TCS00694/13/300/F1417 dated 16 January 2018

Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Nicola Hon
Environmental Consultant
Encl.

c.c.	Mr. Clara U (EPD)	Fax:	2685 1133
	Mr. Steve Lo (CE/BCP, NTEDO, CEDD)	Fax:	3547 1659
	Mr. Simon Leung (ER of C6/ AECOM)	Fax:	2251 0698
	Mr. Antony Wong (IEC, SMEC)		By email

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Agreement No. CE 45/2008

Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works

Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Date		8 January 2018	
Location		WM3x	
Time		11:25	
Parameter		Turbidity (NTU)	Suspended Solids (mg/L)
Action Level		13.4 AND 120% of upstream control station of the same day	12.6 AND 120% of upstream control station of the same day
Limit Level		14.0 AND 130% of upstream control station of the same day	12.9 AND 130% of upstream control station of the same day
Measured Level	**WM3-C**	3.3	3.0
	WM3x	**20.0**	**14.5**
Exceedance		**Limit Level**	**Limit Level**
Investigation Results, Recommendations & Mitigation Measures			

1. According to the site information provided by the Contractor of C6 (CCKJV), the construction activities at South Portal (upstream of WM3x) carried out on 8 January 2018 was mainly tunnel excavation and erection of bridge segment. The monitoring locations and works areas are illustrated in ***Figure 1***.

2. According to the site photo taken on 8 January 2018, the water quality observed at WM3x was slightly turbid and at WM3-C was clear. It was noted that the monitored channel was also received the storm water from road surface of Sha Tau Kok Road and the water quality at WM3x was highly affected by the road runoff especially during rainy day. ***(Photos 1 to 2 and Figure 1***)

3. According to weather record from the Observatory, there was heavy rainstorm on 8 January 2018 and the water quality in the river course was deteriorated by rain and stirred up sediment. Moreover, storm water from road surface of Sha Tau Kok Road entering WM3x was noted during rainy day. ***(Photo 1)***

4. Weekly joint site inspection by RE, Contractor, IEC and ET was conducted on 4 and 11 January 2018 to audit the site environmental performance. The findings of the inspection are summarized below:-

   (a) It was observed that wastewater treatment facilities at South Portal were function properly and the effluent was clear. ***(Photos 3, 5 & 6)***

   (b) It was observed that site hoarding with sealed footing was installed and no runoff from the site area was anticipated. ***(Photo 4)***

   (c) The construction site was general in order and no adverse water quality impact was observed.

5. Based on the above investigation, it is considered that the exceedances were due to the impact of rainstorm and unlikely caused by the works under Contract 6.

6. According to Event and Action, the monitoring frequency at WM3x has been

	increased to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. There were no exceedances triggered in the monitoring result on 9 and 10 January 2018. Nevertheless, the Contractor should continually fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.
Action to be taken	The Contractor is reminded to fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 16 January 2018

Photo Record

Photo 1
During water sampling on 8 January 2018, slightly turbid water was observed at WM3x.

Photo 2
During water sampling on 8 January 2018, the water quality at WM3-C was clear.

Photo 3
Joint site inspection was conducted on 4 January 2018. It was observed that wastewater treatment facilities at South Portal were function properly and the effluent was clear.

Photo 4
Joint site inspection was conducted on 11 January 2018. It was observed that site hoarding with sealed footing was installed and no runoff from the site area was anticipated.

Photo 5
Joint site inspection was conducted on 11 January 2018. It was observed that wastewater treatment facilities were function properly for South Portal and the effluent was clear.

Photo 6
Joint site inspection was conducted on 11 January 2018. It was observed that wastewater treatment facilities were function properly for South Portal the effluent was clear.

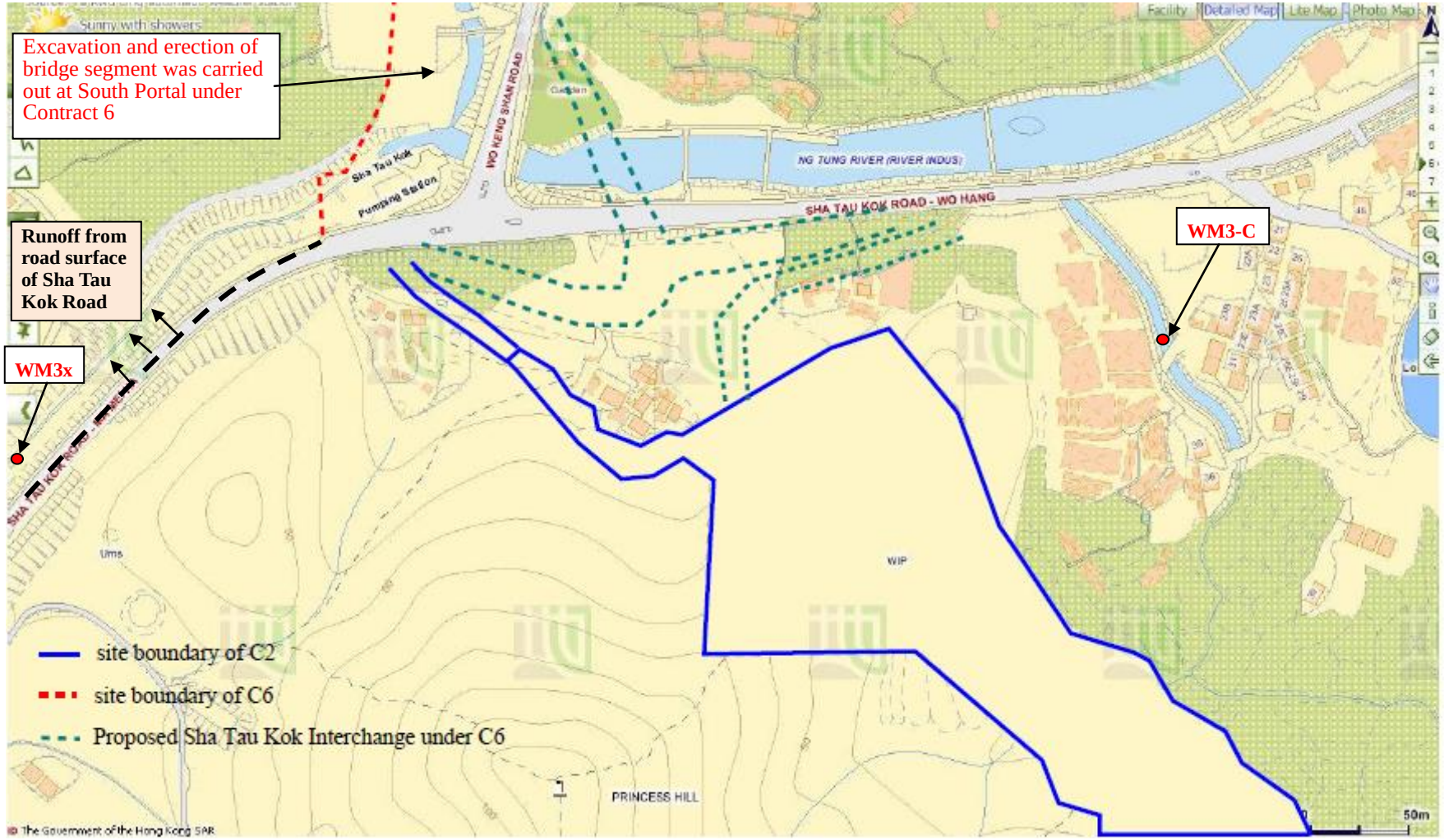

Figure 1 Location Map for Works Area under Contract 6 and Water Quality Monitoring Location

AUES

Fax Cover Sheet

To	**Mr. Vincent Chan**	**Fax No**	**By e-mail**
Company	**CRBC-CEC-Kaden JV**		
cc			
From	**Nicola Hon**	**Date**	**16 January 2018**
Our Ref	TCS00694/13/300/**F1422**	**No of Pages**	7 **(Incl. cover sheet)**
RE	**Agreement No. CE 45/2008** **Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works** **Investigation Report of Exceedance of Water Quality at Location WM2A(a) on 8, 9 and 10 January 2018**		

Dear Sir,

Further to the Notification of Exceedance (NOE) ref.:

TCS00694/13/300/F1407 dated 10 January 2018
TCS00694/13/300/F1422 dated 16 January 2018

Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Nicola Hon
Environmental Consultant

Encl.

c.c.	Ms. Clara U (EPD)	Fax:	2685 1133
	Mr. Steve Lo (CE/BCP, NTEDO, CEDD)	Fax:	3547 1659
	Mr. Simon Leung (ER of C6/ AECOM)	Fax:	2251 0698
	Mr. Antony Wong (IEC, SMEC)		By email

安順聯合環境服務及顧問
Action-United Environmental Services & Consulting
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35-41, Tai Lin Pai Road,
Kwai Chung, New Territories.
Tel (852) 2959-6059 Fax (852) 2959-6079

Agreement No. CE 45/2008

Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works

Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008					
Date		8 Jan 2018	9 Jan 2018	10 Jan 2018	8 Jan 2018	9 Jan 2018	10 Jan 2018
Location		WM2A(a)					
Time		10:24	9:50	10:26	10:24	9:50	10:26
Parameter		Turbidity (NTU)			Suspended solids (mg/L)		
Action Level		24.9 AND 120% of upstream control station of the same day			14.6 AND 120% of upstream control station of the same day		
Limit Level		33.8 AND 130% of upstream control station of the same day			17.3 AND 130% of upstream control station of the same day		
Measured Levels	**WM2A-C**	27.6	45.1	43.5	11.0	23.0	19.5
	WM2A(a)	**71.3**	**290.5**	**115.0**	**34.0**	**158.0**	**62.0**
Exceedance		**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**

Investigation Results, Recommendations & Mitigation Measures

1. According to the site information provided from the Contractor of Contract 6 (CCKJV), construction activities carried out on 8, 9 and 10 January 2018 at Bridge D (upstream of WM2A(a)) were mainly bridge segment erection. The water quality impact station WM2A(a) was temporarily shifted to Nylon Dam during 2 to 12 January 2018 due to demolishment of bridge for sampling at WM2A(a). The monitoring locations and works area are shown in ***Figure 1***.

2. According to the site photos taken by the monitoring team during water sampling on 8, 9 and 10 January 2018, muddy water was observed throughout the river course including control station WM2A-C and temporary impact station Nylon Dam. ***(Photos 1 to 6)***

3. According to the weather information from the Observatory, successive heavy rainstorm was recorded during 7 to 9 January 2018. The water quality throughout the river course was highly affected by the stirred up sediment and muddy runoff from the surrounding environment even outside the construction site. In the afternoon of 8 January 2018, large amount of muddy water was spotted at the upstream area. ***(Photo 7)*** Moreover, the muddy water was trapped at the Nylon Dam at intermediate of the construction site. ***(Photos 1, 3 & 5)***

4. Weekly joint site inspections among the RE, IEC, CCKJV and ET were conducted at Bridge D and adjoin river course on 4 and 11 January 2018 to audit the site environmental performance and implementation of mitigation measures, the observation during the site inspection is summarized below.

   (a) Construction works carried out at Bridge D was mainly bridge segment erection and there was no discharge due to nature of works and no muddy runoff was observed during the site visit.

   (b) Muddy water was observed trapped at the Nylon Dam on 11 January 2018. The source of muddy water was suspected to be flowing from upstream area as observed during 8 to 10 January

	2018. (***Photo 8)*** (c) The existing river water observed on 11 January 2018 was slightly turbid even without the impact from the construction work. (***Photo 9)*** (d) Wastewater treatment facilites were properly provided for Bridge D (***Figure 1)*** (e) As water quality mitigation measures, a bund was set at riverside and covered with tarpaulin sheet to minimize muddy runoff ***(Photo 10)*** (f) As water quality mitigation measures, the slope adjacent to river course was covered with tarpaulin sheet and sand bags were placed along the construction area to avoid muddy runoff flowing to river course. ***(Photo 11 and 12)*** 5. In our investigation, CCKJC had implemented water mitigation measures such as providing temporary bund and tarpaulin sheet align the river course, there were no adverse water quality impact observed during the site inspection. Since the existing river water was found turbid even without adverse water impact of the site and muddy water was also observed at upstream during the exceedance days, it is considered that the exceedances on 8, 9 and 10 January 2018 was related to the rainstorm. 6. According to the Event and Action Plan, the frequency of water monitoring is increase to daily. Additional water quality monitoring was conducted on 11, 12 January 2018 and exceedances were also recorded and investigation would be provided. Nevertheless, the Contractor should continually implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 16 January 2018

Photo Record

 **Photo 1** On 8 January 2018, muddy water was observed at WM2A(a).	 **Photo 2** On 8 January 2018, muddy water was observed at WM2A-C.
 **Photo 3** On 9 January 2018, muddy water was observed at WM2A(a).	 **Photo 4** On 9 January 2018, muddy water was observed at WM2A-C.
 **Photo 5** On 10 January 2018, muddy water was observed at WM2A(a).	 **Photo 6** On 10 January 2018, muddy water was observed at WM2A-C.

Photo 7

In the afternoon of 8 January, large amount of muddy water was spotted at upstream area.

Photo 8

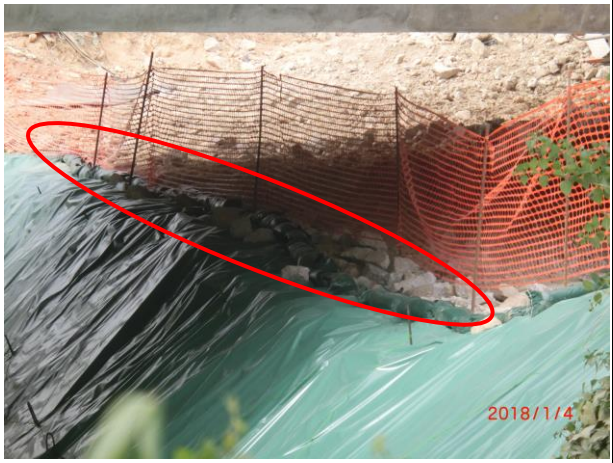
Muddy water was observed trapped at the Nylon Dam on 11 January 2018. The source of muddy water was suspected to be flowing from upstream area as observed during 8 to 10 January 2018.

Photo 9

The existing river water observed on 11 January 2018 was slightly turbid even without the impact from the construction work.

Photo 10

As water quality mitigation measures, a bund was set at riverside and covered with tarpaulin sheet to minimize muddy runoff.

	
Photo 11 As water quality mitigation measures, the slope adjacent to river course was covered with tarpaulin sheet and sand bags were placed along the construction area to avoid muddy runoff flowing to river course.	**Photo 12** As water quality mitigation measures, the slope adjacent to river course was covered with tarpaulin sheet and sand bags were placed along the construction area to avoid muddy runoff flowing to river course.

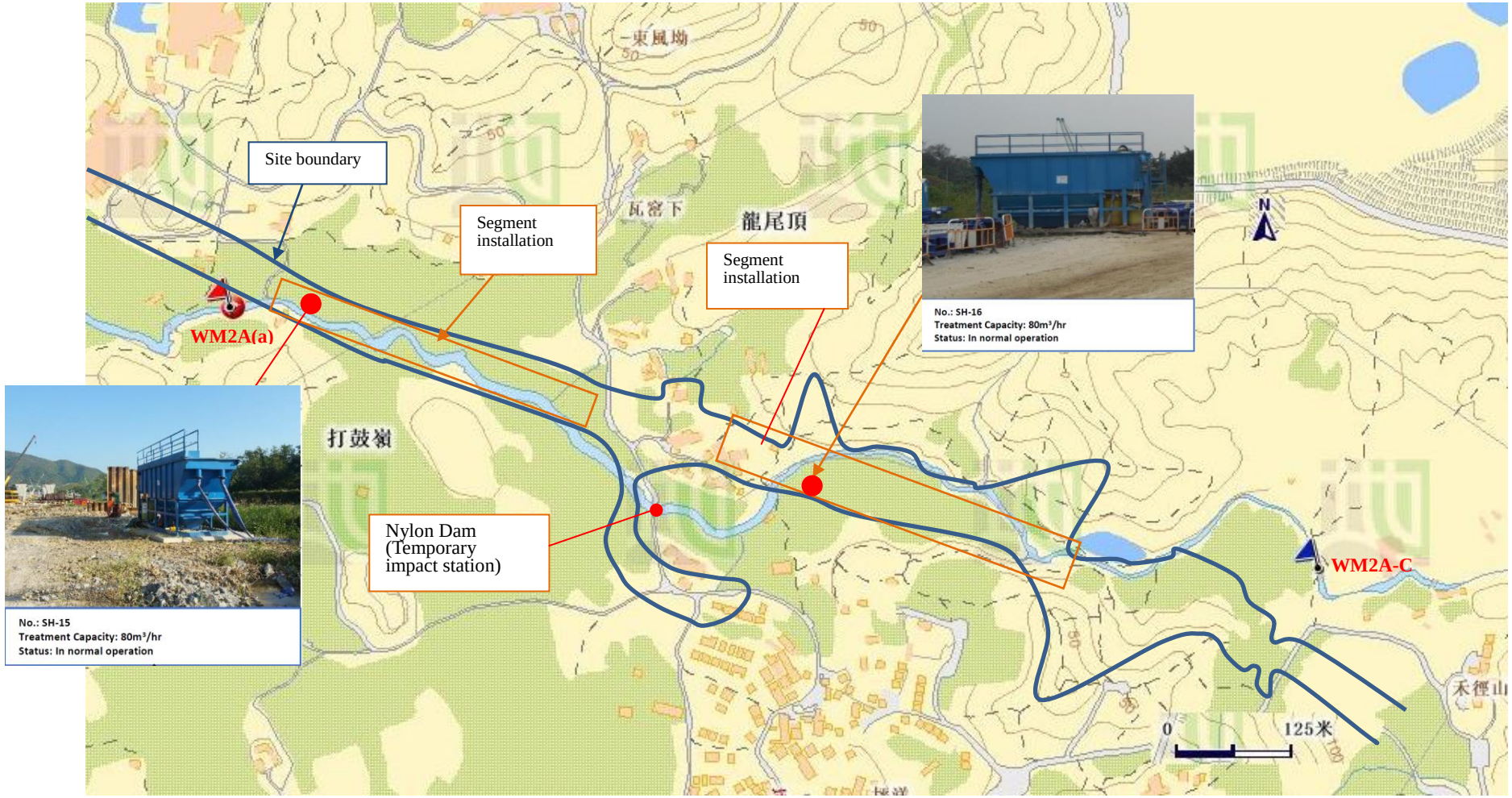


Figure 1 Location Map for Water Quality Monitoring Locations WM2A(a), WM2A-Control and work area under Contract

AUES

Fax Cover Sheet

To	**Mr. Vincent Chan**	**Fax No**	**By e-mail**
Company	**CRBC-CEC-Kaden JV**		
cc			
From	**Nicola Hon**	**Date**	**22 January 2018**
Our Ref	TCS00694/13/300/**F1428a**	**No of Pages**	7 **(Incl. cover sheet)**
RE	**Agreement No. CE 45/2008** **Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works** **Investigation Report of Exceedance of Water Quality at Location WM2A(a) on 11, 12 and 13 January 2018**		

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Dear Sir,

Further to the Notification of Exceedance (NOE) ref.:

TCS00694/13/300/F1415 dated 12 January 2018
TCS00694/13/300/F1419 dated 16 January 2018
TCS00694/13/300/F1427 dated 18 January 2018
TCS00694/13/300/F1428 dated 18 January 2018

Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Nicola Hon
Environmental Consultant

Encl.

c.c.	Ms. Clara U (EPD)	Fax:	2685 1133
	Mr. Steve Lo (CE/BCP, NTEDO, CEDD)	Fax:	3547 1659
	Mr. Simon Leung (ER of C6/ AECOM)	Fax:	2251 0698
	Mr. Antony Wong (IEC, SMEC)		By email

安順聯合環境服務及顧問
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Kwai Chung, New Territories.
Tel (852) 2959-6059 Fax (852) 2959-6079

Agreement No. CE 45/2008

Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works

Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008					
Date		11 Jan 2018	12 Jan 2018	13 Jan 2018	11 Jan 2018	12 Jan 2018	13 Jan 2018
Location		WM2A(a)					
Time		10:10	11:20	9:20	10:10	11:20	9:20
Parameter		Turbidity (NTU)			Suspended solids (mg/L)		
Action Level		24.9 AND 120% of upstream control station of the same day			14.6 AND 120% of upstream control station of the same day		
Limit Level		33.8 AND 130% of upstream control station of the same day			17.3 AND 130% of upstream control station of the same day		
Measured Levels	**WM2A-C**	35.0	24.8	26.7	18.0	16.0	7.0
	WM2A(a)	**67.2**	**39.1**	**58.3**	**52.0**	**20.0**	**34.5**
Exceedance		**Limit Level**	**Limit Level**	**Limit Level**	**Limit Level**	**Action Level**	**Limit Level**

Investigation Results, Recommendations & Mitigation Measures

1. According to the site information provided from the Contractor of Contract 6 (CCKJV), construction activities carried out on 11, 12, 13 January 2018 at Bridge D (upstream of WM2A(a)) were mainly bridge segment erection. The water quality impact station WM2A(a) was temporarily shifted to Nylon Dam during 2 to 12 January 2018 due to demolishment of bridge for sampling at WM2A(a). The monitoring locations and works area are shown in ***Figure 1***.

2. According to the site photos taken by the monitoring team during water sampling on 11 and 12 January 2018, turbid water was observed throughout the river course including control station WM2A-C and temporary impact station Nylon Dam. ***(Photos 1 to 4)*** On 13 January 2018, turbid water was observed at WM2A(a) while the water quality at WM2A-C was slightly turbid. ***(Photos 5 & 6)***

3. According to the weather information from the Observatory, successive heavy rainstorm was recorded during 7 to 9 January 2018. The water quality throughout the river course was highly affected by the stirred up sediment and muddy runoff from the surrounding environment even outside the construction site. The muddy water was trapped at the Nylon Dam at intermediate of the construction site. ***(Photos 1 & 3)***

4. Weekly joint site inspections among the RE, IEC, CCKJV and ET were conducted at Bridge D and adjoin river course on 4 and 11 January 2018 to audit the site environmental performance and implementation of mitigation measures, the observation during the site inspection is summarized below.

   (a) Construction works carried out at Bridge D was mainly bridge segment erection and there was no discharge due to nature of works and no muddy runoff was observed during the site visit.

   (b) Muddy water was observed trapped at the Nylon Dam on 11 January 2018. The source of muddy water was suspected to be flowing from upstream area as observed during 8 to 10 January

	2018. (***Photo 7)*** (c) The existing river water observed on 11 January 2018 was slightly turbid even without the impact from the construction work. (***Photo 8)*** (d) Wastewater treatment facilites were properly provided for Bridge D (***Figure 1)*** (e) As water quality mitigation measures, a bund was set at riverside and covered with tarpaulin sheet to minimize muddy runoff ***(Photo 9)*** (f) As water quality mitigation measures, the slope adjacent to river course was covered with tarpaulin sheet and sand bags were placed along the construction area to avoid muddy runoff flowing to river course. ***(Photo 10 and 11)*** 5. In our investigation, CCKJC had implemented water quality mitigation measures such as providing temporary bund and tarpaulin sheet align the river course, there were no adverse water quality impact observed during the site inspection. Since the existing river water was found turbid even without adverse water impact of the site and muddy water was also observed at upstream during the exceedance days, it is considered that the exceedances on 11, 12 and 13 January 2018 was related to the residual impact of rainstorm in previous days. 6. According to the Event and Action Plan, the frequency of water monitoring is increase to daily. Additional water quality monitoring was conducted on 15 and 16 January 2018 and no exceedances were recorded. Nevertheless, the Contractor should continually implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 22 January 2018

Photo Record

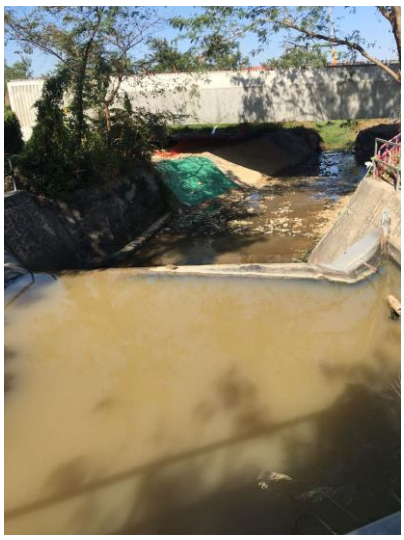

Photo 1

On 11 January 2018, turbid water was observed at temporary impact station Nylon Dam.

Photo 2

On 11 January 2018, turbid water was observed at WM2A-C.

Photo 3

On 12 January 2018, turbid water was observed at temporary impact station Nylon Dam.

Photo 4

On 12 January 2018, turbid water was observed at WM2A-C.

Photo 5

On 13 January 2018, turbid water was observed at WM2A(a).

Photo 6

On 13 January 2018, the water quality observed at WM2A-C was slightly turbid.

Photo 7

During site inspection on 11 January 2018, muddy water was observed trapped at the Nylon Dam. The source of muddy water was suspected to be flowing from upstream area as observed during 8 to 10 January 2018.

Photo 8

The existing river water observed on 11 January 2018 was slightly turbid even without the impact from the construction work.

Photo 9

As water quality mitigation measures, a bund was set at riverside and covered with tarpaulin sheet to minimize muddy runoff.

Photo 10

As water quality mitigation measures, the slope adjacent to river course was covered with tarpaulin sheet and sand bags were placed along the construction area to avoid muddy runoff flowing to river course

Photo 11

As water quality mitigation measures, the slope adjacent to river course was covered with tarpaulin sheet and sand bags were placed along the construction area to avoid muddy runoff flowing to river course.

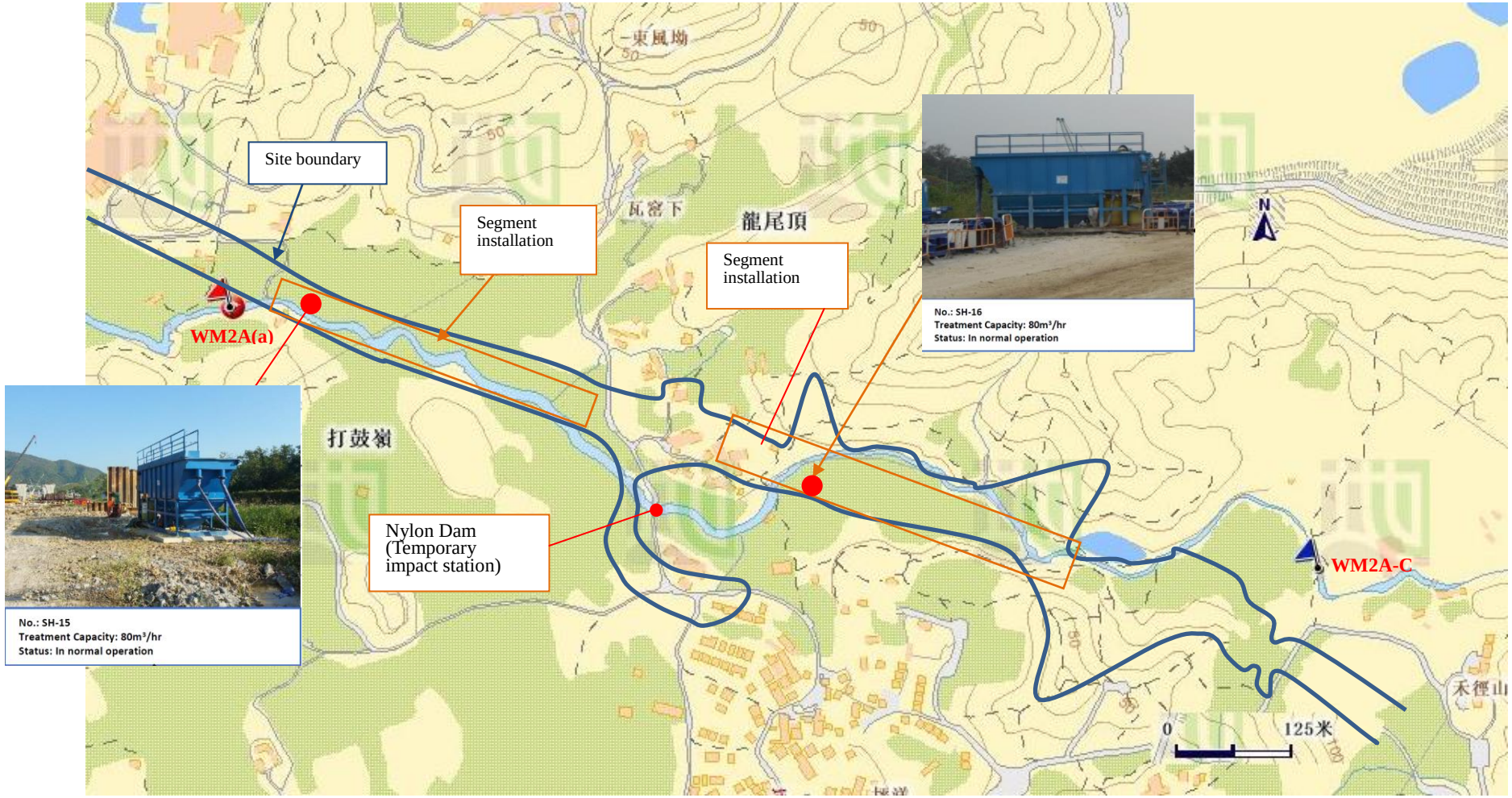

Figure 1 Location Map for Water Quality Monitoring Locations WM2A(a), WM2A-Control and work area under Contract

AUES

Fax Cover Sheet

To	**Mr. Roger Lee**	**Fax No**	**2717 3299**
Company	**Dragages Hong Kong Limited**		
cc			
From	**Nicola Hon**	**Date**	**12 February 2018**
Our Ref	TCS00697/13/300/**F1451a**	**No of Pages**	6 **(Incl. cover sheet)**

RE **Agreement No. CE 45/2008**
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report of Exceedance of Water Quality at Location WM3x on 27 January 2018 (Contract 2)

If you do not receive all pages, or transmission is illegible, please contact the originator on (852) 2959-6059 to re-send. Should this facsimile be sent to the wrong fax number, would receiver please destroy this copy and notify Action-United Environmental Services & Consulting immediately. Thank you.

Dear Mr. Lee,

Further to the Notification of Exceedance (NOE) ref.:

TCS00694/13/300/F1435 dated 29 January 2018
TCS00694/13/300/F1442 dated 1 February 2018

Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Nicola Hon
Environmental Consultant

Encl.

c.c.	Ms. Clara U (EPD)	Fax:	2685 1133
	Mr. Edwin Ching (CRE, AECOM)	Fax:	2171 3498
	Mr. Antony Wong (IEC, SMEC)		By e-mail

安順聯合環境服務及顧問
Action-United Environmental Services & Consulting
Flat A, 20/F, Gold King Industrial Building,
35-41, Tai Lin Pai Road,
Kwai Chung, New Territories.
Tel (852) 2959-6059 Fax (852) 2959-6079

Agreement No. CE 45/2008
Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works
Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Date		27 January 2018	
Location		WM3x	
Time		10:37	
Parameter		Turbidity (NTU)	Suspended Solids (mg/L)
Action Level		13.4 AND 120% of upstream control station of the same day	12.6 AND 120% of upstream control station of the same day
Limit Level		14.0 AND 130% of upstream control station of the same day	12.9 AND 130% of upstream control station of the same day
Measured Level	**WM3-C**	9.7	8.0
	WM3x	**152.5**	**669.5**
Exceedance		**Limit Level**	**Limit Level**
Investigation Results, Recommendations & Mitigation Measures		1. According to the site information provided from the Contractor of C2 (DHK), the construction activities carried out on 27 January 2018 at upstream of WM3x were building internal structure, fitting out and E&M activities, installation of curtain wall, construction of fence wall, permanent drainage and underground utilities for Admin Building and tunnel works at North Portal Site. The relevant works area under C2 and the water monitoring locations are illustrated in ***Figure 1***. 2. According to the site photo taken on 27 January 2018, turbid water observed at WM3x and at WM3-C was clear. (***Photos 1 to 2 and Figure 1***) 3. Inspection was carried out at upstream of WM3x, a vehicle was found parked on the access road in Ng Tung River, suspecting for channel maintenance by other party and turbid water was observed since there. (***Photo 3 and Figure 1***) DHK explained that the vehicle was not belonging to them as they have no permit to access the channel area. Moreover, it was observed that the water quality from North Portal Site and Admin Building Site were clear and no deteriorated water quality was noted from both Sites. ***(Photos 4 & 5)*** 4. Joint site inspections with AECOM, IEC, DHK and ET were carried out in January 2018. At Admin Building Site, it was observed that site area was mostly hard paved and wastewater generated from the construction works was limited. The adjacent channel and catch pit receiving the wastewater from Admin Building and upstream area were clear and no adverse water quality impact was identified during site inspection. ***(Photos 6 & 7)*** At North Portal Site, it was observed wastewater treatment facilities were in place properly, and the water quality outside the discharge point at downstream Loi Tung Stream was visually clear. ***(Photos 8)*** Based on the above investigation, it is considered that the exceedances were related to other source of turbid water and not caused by the works under Contract 2. 5. According to Event and Action, the monitoring frequency at WM3x has been increased to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. There were no exceedances triggered in the monitoring result on 28 and 29 January 2018. Nevertheless, the Contractor should continually fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.	

Prepared By :	Nicola Hon
Designation :	Environmental Consultant
Signature :	
Date :	12 February 2018

Photo Record

Photo 1
During water sampling on 27 January 2018, turbid water was observed at WM3x.

Photo 2
During water sampling on 27 January 2018, the water quality flowing at WM3-C was clear.

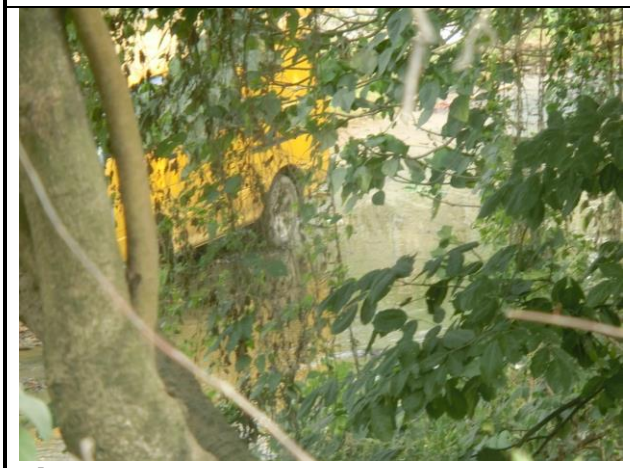

Photo 3
Inspection was carried out at upstream of WM3x, a vehicle was found parked on the access road in Ng Tung River, suspecting for channel maintenance by other party and turbid water was observed since there. DHK explained that the vehicle was not belonging to them as they have no permit to access the channel area.

Photo 4
On 27 January 2018, it was observed that the water quality from North Portal Site was clear and no deteriorated water quality was noted.

Photo 5
On 27 January 2018, it was observed that the water quality from Admin Building Site was clear and no deteriorated water quality was noted.

Photo 6
Joint site inspection was conducted on 12 January 2018. It was observed that the water quality in the adjacent channel receiving the wastewater from Admin Building and upstream area were clear.

Photo 7
Joint site inspection was conducted on 12 January 2018. It was observed that the water quality in the catch pit receiving the wastewater from Admin Building and upstream area were clear.

Photo 8
Joint site inspection was conducted on 25 January 2018, the water quality outside the discharge point at downstream Loi Tung Stream was visually clear.

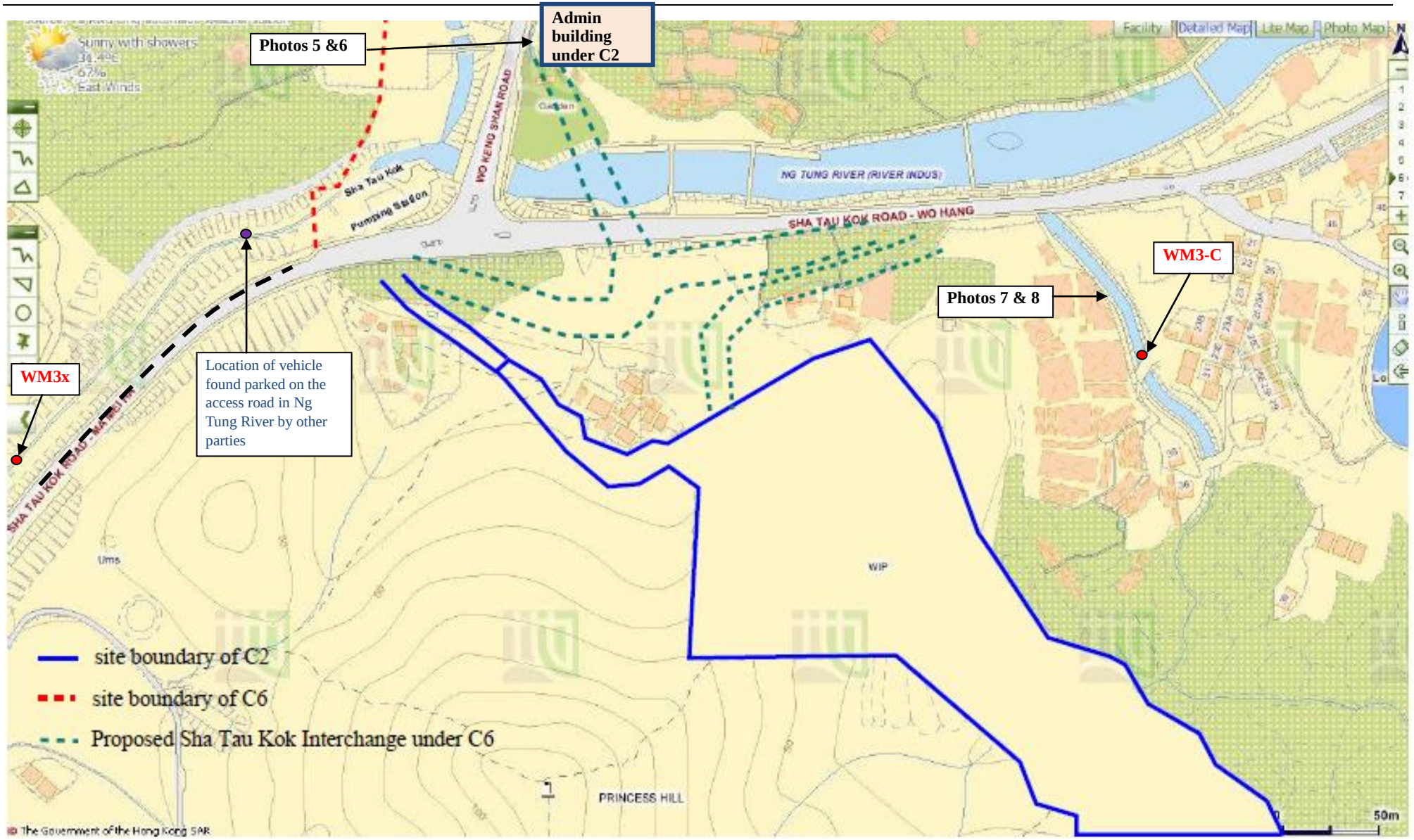

Figure 1 Location Map for Works Area under Contract 2 and Water Quality Monitoring Location

AUES

Fax Cover Sheet

To	**Mr. Vincent Chan**	**Fax No**	**By e-mail**
Company	**CRBC-CEC-Kaden JV**		
cc			
From	**Nicola Hon**	**Date**	**9 February 2018**
Our Ref	TCS00694/13/300/**F1450**	**No of Pages**	6 **(Incl. cover sheet)**
RE	**Agreement No. CE 45/2008 Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works Investigation Report of Exceedance of Water Quality at Location WM3x on 27 January 2018 (Contract 6)**		

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Dear Sir,

Further to the Notification of Exceedance (NOE) ref.:

TCS00694/13/300/F1434 dated 29 January 2018
TCS00694/13/300/F1441 dated 1 February 2018

Please find attached the "Investigation Report on Action or Limit Level Non-compliance" referenced above for your follow up action.

Should you have any queries or need further information, please do not hesitate to contact us or the undersigned at **Tel: 2959-6059 or Fax: 2959-6079**.

Yours Faithfully,
For and on Behalf of
Action-United Environmental Services & Consulting

Nicola Hon
Environmental Consultant
Encl.

c.c.	Mr. Clara U (EPD)	Fax:	2685 1133
	Mr. Steve Lo (CE/BCP, NTEDO, CEDD)	Fax:	3547 1659
	Mr. Simon Leung (ER of C6/ AECOM)	Fax:	2251 0698
	Mr. Antony Wong (IEC, SMEC)		By email

安順聯合環境服務及顧問
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Agreement No. CE 45/2008

Liantang/ Heung Yuen Wai Boundary Control Point and Associated Works

Investigation Report on Action or Limit Level Non-compliance

Project		CE 45/2008	
Date		27 January 2018	
Location		WM3x	
Time		10:37	
Parameter		Turbidity (NTU)	Suspended Solids (mg/L)
Action Level		13.4 AND 120% of upstream control station of the same day	12.6 AND 120% of upstream control station of the same day
Limit Level		14.0 AND 130% of upstream control station of the same day	12.9 AND 130% of upstream control station of the same day
Measured Level	**WM3-C**	9.7	8.0
	WM3x	**152.5**	**669.5**
Exceedance		**Limit Level**	**Limit Level**
Investigation Results, Recommendations & Mitigation Measures			

1. According to the site information provided by the Contractor of C6 (CCKJV), the construction activities at South Portal Site (upstream of WM3x) carried out on 27 January 2018 was mainly tunnel excavation and erection of bridge segment. The monitoring locations and works areas are illustrated in ***Figure 1***.

2. According to the site photo taken on 27 January 2018, the water quality observed at WM3x was turbid and at WM3-C was clear. ***(Photos 1 to 2 and Figure 1***)

3. Inspection was carried out at upstream of WM3x, a vehicle was found parked on the access road in Ng Tung River, suspecting for channel maintenance by other party and turbid water was observed since there. ***(Photo 3 and Figure 1***) CCKJV explained that the vehicle was not belonging to them as they have no permit to access the channel area. Moreover, it was observed that the water quality in the channel of South Portal Site was clear and no deteriorated water quality was noted from South Portal Site. ***(Photo 4)***

4. Weekly joint site inspection by RE, Contractor, IEC and ET was conducted on 1 February 2018 to audit the site environmental performance. The findings of the inspection are summarized below:-

   (a) It was observed that wastewater treatment facilities at South Portal were function properly and the effluent was clear. ***(Photo 5)***

   (b) It was observed that site hoarding with sealed footing was installed and no runoff from the site area was anticipated.

   (c) The construction site was general in order and no adverse water quality impact was observed.

5. Based on the above investigation, it is considered that the exceedances were due to other source of turbid water and unlikely caused by the works under Contract 6.

6. According to Event and Action, the monitoring frequency at WM3x has been

	increased to daily due to the limit level exceedance recorded until no exceedances were triggered in consecutive days. There were no exceedances triggered in the monitoring result on 29 and 30 January 2018. Nevertheless, the Contractor should continually fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.
Action to be taken	The Contractor is reminded to fully implement the water mitigation measures as recommended in the implementation schedule for environmental mitigation measures in the EM&A Manual.

Prepared By : Nicola Hon

Designation : Environmental Consultant

Signature : 

Date : 9 February 2018

Photo Record

 **Photo 1** During water sampling on 27 January 2018, turbid water was observed at WM3x.	 **Photo 2** During water sampling on 27 January 2018, the water quality flowing at WM3-C was clear.
 **Photo 3** Inspection was carried out at upstream of WM3x, a vehicle was found parked on the access road in Ng Tung River, suspecting for channel maintenance by other party and turbid water was observed since there. CCKJV explained that the vehicle was not belonging to them as they have no permit to access the channel area.	 **Photo 4** On 27 January 2018, it was observed that the water quality in the channel of South Portal Site was clear and no deteriorated water quality was noted from South Portal Site.

 **Photo 5** Joint site inspection was conducted on 1 February 2018. It was observed that wastewater treatment facilities at South Portal were function properly and the effluent was clear.	

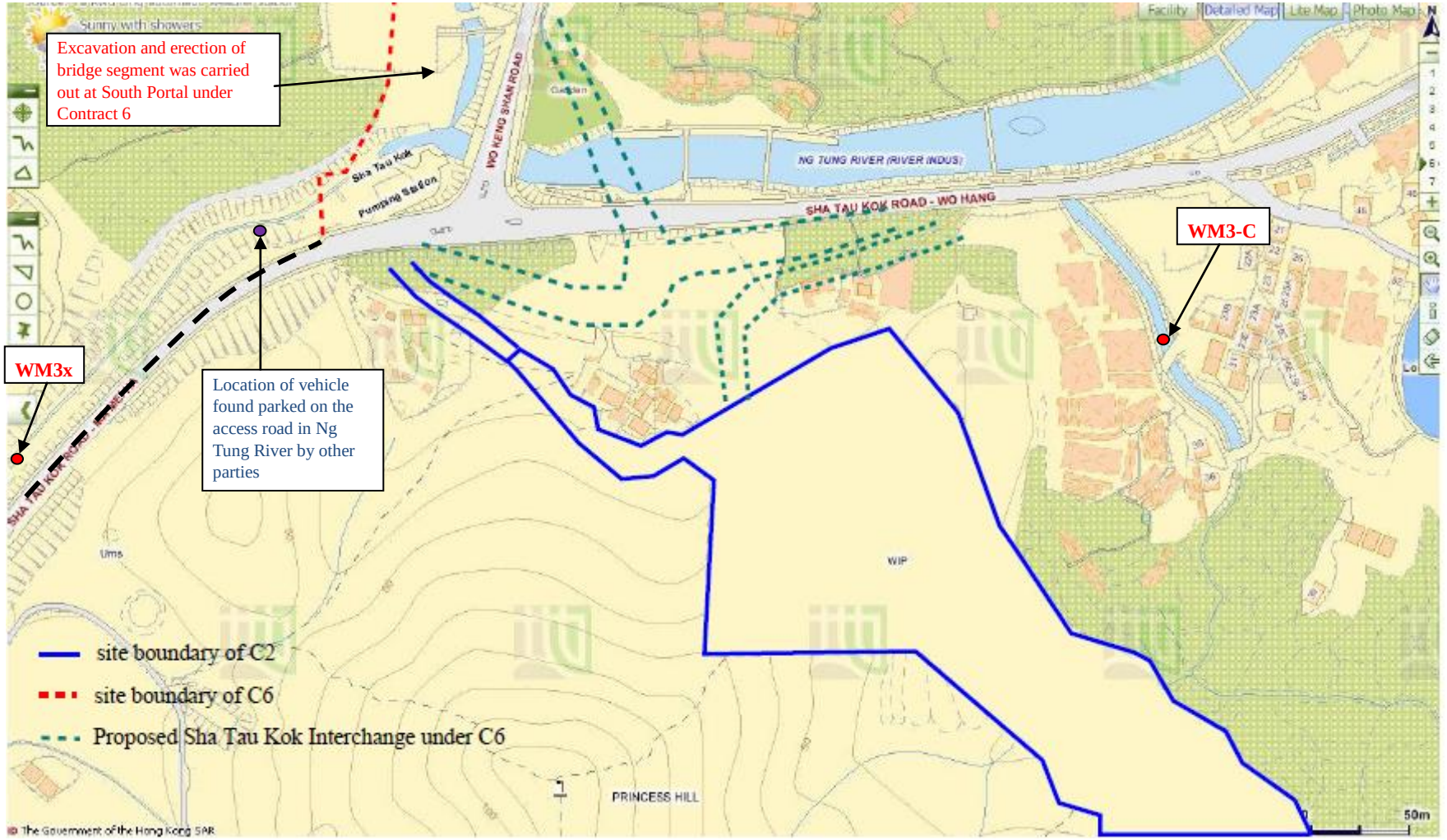

Figure 1 Location Map for Works Area under Contract 6 and Water Quality Monitoring Location

Appendix O

Investigation Report for Complaint

Not Applicable